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MANUSCRIPT COPY
TECHNICAL MANUAL

OPERATION INSTRUCTIONS
MAINTENANCE INSTRUCTIONS
ILLUSTRATED PARTS BREAKDOWN

GENERATOR,PULSE SG-1021/G

INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION
AEROSPACE/OPTICAL DIVISION
ELECTRO-OPTICAL OPERATIONS

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INTRODUCTION

This manual contains information required to install, operate and maintain the Generator, Pulse SG-1021/G.

The Generator, Pulse SG-1021/G is intended to provide a radar pre-trigger and five video signals necessary for the alignment of Amplifier, Trigger-Pulse Video AM-6458/G.

Information in this manual is presented in eight chapters. Chapter 1 contains a description of the equipment from a functional standpoint including its capabilities and limitations. Information is provided covering leading particulars, equipment supplied and equipment required but not supplied. Chapter 2 contains installation logistics and installation procedures. Chapter 3 contains information on the preparation for use including tuneup, testing and adjustment procedures that are required to bring the equipment up to acceptable standards. Reshipment instructions are also presented. Chapter 4 contains operation information such as controls and indicators, operating instructions and emergency operation. Chapter 5 presents the theory of operation which includes the operation of each individual circuit. Chapter 6 contains maintenance and alignment procedures. Chapter 7 contains all circuit diagrams applicable to the equipment. Chapter 8 provides an illustrated parts breakdown of the equipment.

Changes to this manual will be indicated by a vertical line or change symbol in the margin extending close to the entire area affected (outer margin for double-column material, margin opposite binding edge for single-column material); exception; pages with emergency markings (black diagonal lines around these edges) may have the vertical line or change symbol placed along the inner margins. Change symbols are not used for:

a. Introductory material.

b. Indexes and tabular data where changes cannot be identified.

c. Blank space resulting from the deletion of text, an illustration or table.

d. Correction of minor inaccuracies such as spelling, punctuation, relocation of material, etc., unless such correction changes the meaning of instructive information and procedures.

No change symbols appear in the original issue of this manual.

The following publications are listed for reference and govern the manner of preparation, use of symbols, terms, reference designations and abbreviations in this manual.

Military Specifications:

MIL-M-38784	Manuals, Technical: General Requirement for Preparation Of.
MIL-M-38798	Manuals, Technical: Operation Instructions, Maintenance Instructions, Circuit Diagrams, Alignment Procedures and Installation Planning.
MIL-M-8910	Manuals, Technical: Illustrated Parts Breakdown, Preparation Of.
MIL-STD-12	Abbreviations for Use on Drawings and in Technical Type Publications.
MIL-STD-15-1	Graphical Symbols for Electrical and Electronic Diagrams.
MIL-STD-806	Graphical Symbols for Logic Diagrams.
USAS Y14.15-1966	Electrical and Electronic Diagrams.
USAS Y32.16-1965	Electrical and Electronics Reference Designations.

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Figure 1-1. Generator, Pulse SG-1021/G

CHAPTER 1
GENERAL INFORMATION

1-1. INTRODUCTION. This chapter contains information concerning the Generator, Pulse SG-1021/G (hereinafter referred to as the Pulse Generator). See figure 1-1. A description of the equipment's purpose and strategic mission, leading particulars, and capabilities and limitations are discussed in the following paragraphs.

1-2. DESCRIPTION AND PURPOSE

1-3. The Pulse Generator consists of one unit contained in a portable instrument case. All operational controls and connectors are accessible when the cover is open. See figure 1-1. The control panel contains the line cord for power input, the Power ON-OFF switch and an associated pilot lamp, a self-indicating cartridge fuse holder and all the controls and connectors required for operation of the equipment.

1-4. The purpose of the Pulse Generator is to provide all signals necessary for alignment of the Amplifier, Trigger-Pulse Video AM-6458/G or other similar equipment. The Pulse Generator accomplishes this by generating a radar pre-trigger output and five video outputs delayed relative to the trigger and to each other. The pre-trigger has a variable prf adjustable from 250 to 1600 pps and can be synchronized with an external trigger in this prf range. Two types of video are available, a narrow video pulse for adjusting system rise time and overshoot, and a wide video pulse for checking system droop. Amplitudes of the video outputs are independently adjustable.

1-5. LEADING PARTICULARS.

1-6. The physical and electrical logistic characteristics of the Pulse Generator are listed in table 1-1.

1-7. CAPABILITIES AND LIMITATIONS

1-8. The capabilities and limitations of the Pulse Generator are listed in table 1-2.

1-9. EQUIPMENT SUPPLIED.

1-10. The Pulse Generator is supplied as a self-contained unit in one portable instrument case.

1-11. TEST EQUIPMENT LIST

1-12. Test equipment required for organizational and field maintenance but not supplied as part of the Pulse Generator is listed in table 1-3.

1-13. RELATED TECHNICAL MANUALS

1-14. Related technical manuals are listed in table 1-4.

Table 1-1. Leading Particulars

CHARACTERISTIC	REQUIREMENT
Primary Input Power	40 watts
Voltage	105 to 130 vac, single phase
Frequency	47 to 63 hz
Physical Description	
Dimensions	10-1/2 inches high; 13-1/2 inches wide; 11-3/4 inches deep
Weight	
Unpacked	15 lbs
Packed	20 lbs
Storage Conditions	
Non-Operating Temperature Limits	-40°C (-40°F) to +70°C (+160°F)
Humidity	Building Ambient

Table 1-2. Capabilities and Limitations

CHARACTERISTIC	REQUIREMENT
Trigger Input	
Amplitude	10 to 70 volts
Polarity	Positive
Pulse Width	0.3 to 4.0 μsec
PRF	250 to 1600 pulses per second

Table 1-2. Capabilities and Limitations (Cont.)

CHARACTERISTIC	REQUIREMENT
Pre-Trigger Output	
Amplitude	7.5 volts minimum
Pulse Width	2 µsec ± 1 µsec
Polarity	Positive
Rise Time	100 nsec maximum
Video Outputs	
Amplitude	Adjustable from 1.0 to 3.5 volts
Polarity	Positive
Pulse Width	Narrow - 0.8 µsec ± 0.2 µsec Wide - 300 µsec ± 30 µsec
Rise Time	80 nsec maximum
Overshoot	10% maximum
Timing	
MTI Video	Variable 30 to 150 µsec after leading edge of pre-trigger pulse
Normal Video	5 µsec ± 2 µsec after leading edge of MTI video pulse
IFF Video	5 µsec ± 2 µsec after leading edge of Normal video pulse
Map Video	5 µsec ± 2 µsec after leading edge of IFF video pulse
Spare Video	5 µsec ± 2 µsec after leading edge of Map video pulse
Environmental	
Operating Temperature Limits	$0^{\circ}C$ ($32^{\circ}F$) to $+50^{\circ}C$ ($+122^{\circ}F$)
Humidity	0 to 100% relative humidity

Table 1-3. Test Equipment List

MODEL OR TYPE DESIGNATION	NOMENCLATURE	USE
(Equivalent Items May Be Used)		
AN/PSM6A	Multimeter	ac and dc measurements
Tektronix 453	Oscilloscope	Refer to table 6-2.
Tektronix P6010	Probe, Voltage	Refer to table 6-2.
8114911G1	Extender card	Refer to paragraph 6-13.

Table 1-4. Related Technical Manuals

PUBLICATION NUMBER	TITLE	EQUIPMENT NOMENCLATURE
T.O.31P5-2G-12	Service, Circuit Diagrams and Illustrated Parts Breakdown	Amplifier, Trigger Pulse-Video AM-6458/G

CHAPTER 2
INSTALLATION

2-1. INTRODUCTION. Information and instructions necessary to unpack and prepare the Pulse Generator for operation are provided in this chapter. Section I contains information relative to installation logistics. Section II contains information relative to installation procedures.

SECTION I
INSTALLATION LOGISTICS

2-2. GENERAL

2-3. The Pulse Generator is a portable unit designed to be hand carried and table top mounted. The instrument case in which the unit is housed has four rubber feet on the bottom.

2-4. RECEIVING DATA

2-5. The Pulse Generator is packed in a fiberboard carton and protected by a 1-1/2 inch thick cushion of latex hair. Table 2-1 indicates the packed and unpacked dimensions, and weights of the unit.

2-6. UNPACKING DATA

2-7. Inspect the shipping container for in-transit damage then remove the equipment from the container and inspect the equipment for physical damage, such as cracks or dents on the case or dented connectors. Do not attempt to operate the equipment if it is damaged.

2-8. CABLE REQUIREMENTS

2-9. The Pulse Generator has only one cable, an ac power cable, which is an integral part of the equipment and can be connected to any convenient 105 to 130 vac, 60 hz outlet.

2-10. BUILDING REQUIREMENTS

2-11. The environmental conditions in which the Pulse Generator should be stored are listed in table 1-1.

SECTION II
INSTALLATION PROCEDURES

2-12. Since the Pulse Generator is portable it can be used wherever it is convenient, provided there is an available 105 to 130 vac, 60 hz outlet.

Table 2-1. Packing Data

QTY	DESCRIPTION	UNPACKED DIMENSIONS	PACKED DIMENSIONS	UNPACKED WEIGHT	PACKED WEIGHT
1	Pulse Generator	10-1/2 inches high	12 inches high	15 lbs	20 lbs
		13-1/2 inches wide	15 inches wide		
		11-3/4 inches deep	13-1/4 inches deep		

CHAPTER 3
PREPARATION FOR USE AND RESHIPMENT

3-1. INTRODUCTION. The information necessary to prepare the Pulse Generator for operation and reshipment is contained in this chapter. Section I covers preparation for use and Section II provides reshipment information.

SECTION I
PREPARATION FOR USE

3-2. GENERAL

3-3. The Pulse Generator is self-contained and ready for use. No tuneup, testing or alignment is necessary to bring the equipment up to acceptable standards.

SECTION II
PREPARATION FOR RESHIPMENT

3-4. GENERAL

3-5. The preferred method of packing for reshipment is to use the original container. In the event that the original container is not available refer to paragraph 2-5.

CHAPTER 4
OPERATION

4-1. INTRODUCTION. This chapter contains information and instructions, pertaining to the operation of the Pulse Generator. Section I contains illustrations of controls and indicators, and provides a brief description of each. Section II provides operating instructions. Section III, Emergency Operation is not applicable.

SECTION I
CONTROLS AND INDICATORS

4-2. GENERAL

4-3. This section contains illustrations and tables which identify and describe all operating controls and indicators.

4-4. Operating controls and indicators are listed and described in table 4-1 and illustrated in figure 4-1. No interlocks are used in the Pulse Generator.

SECTION II
OPERATING INSTRUCTIONS

4-5. STARTING, OPERATING AND STOPPING PROCEDURES

4-6. This section presents the starting procedure, operating procedure and stopping procedure.

4-7. STARTING PROCEDURE

4-8. Connect cables as follows:

NOTE: Unless otherwise specified, all connectors and switches are contained on the Pulse Generator.

1. If an external trigger is to be used for output signal timing, connect the external signal to TRIG IN connector.

2. If needed, connect the PRE-TRIG OUT signal to the unit under test.

3. The five video output signals MTI, NORM, IFF, MAP and SPARE have the same parameters. The only difference being that none of the signals start at the same time. Refer to figure 6-1 for the timing. The video outputs have been labeled as a reference assistance when checking out equipment that accepts signals with the same video titles. Therefore, connect the MTI video out signal to the MTI video input point on the unit under test. Perform the same procedure for the other four outputs.

Table 4-1. Operating Controls and Indicators

CONTROL OR INDICATOR	REF DES	FUNCTION
Power ON/OFF Switch	S1	Applies primary input power to Pulse Generator when in ON position.
Power Indicator	DS1	Indicates primary input power is applied to Pulse Generator via ON/OFF switch.
F1 1A Indicating Fuse	E1	Indicates loss of primary power to Pulse Generator, illuminates when fuse F1 is open.
PULSE WIDTH µSEC Switch	S2	Two position switch selects either 0.8 µsec or 300 µsec pulse width.
DELAY Control	R2	Adjusts delay time between pretrigger and video signals.
FREQ Control	R1	Varies prf from 250 to 1600 pps.
The following controls are not marked but are on the front panel immediately above the the name plate. Starting from left to right, the controls are as follows:		
MTI Amplitude Adjust	R7	Varies output amplitude of the MTI video pulse between 1 and 3.5 volts.
NORMAL Amplitude Adjust	R6	Varies output amplitude of the NORMAL video pulse between 1 and 3.5 volts.
IFF Amplitude Adjust	R5	Varies output amplitude of IFF video pulse between 1 and 3.5 volts.
MAP Amplitude Adjust	R4	Varies output amplitude of MAP video pulse between 1 and 3.5 volts.
SPARE Amplitude Adjust	R3	Varies output amplitude of SPARE video pulse between 1 and 3.5 volts.

Figure 4-1. Operating Controls and Indicators

4-9. After proper cable connections are accomplished with the external equipment to be tested, perform the following procedures.

1. Plug the input power cable into a convenient 105-130 vac, 60 hz outlet.

2. Place the Power ON/OFF switch in the ON position, and observe that the power indicator is illuminated.

4-10. OPERATING PROCEDURE

4-11. The Pulse Generator should be set up as follows:

1. If an external trigger source is not being used, while observing the Pretrigger out signal, adjust the FREQ control to obtain the desired pulse PRF. If an external trigger source is being used, this FREQ control will have no effect.

2. Adjust the DELAY control to obtain the desired delay between the Pretrigger out and the MTI Video pulse. The MTI video pulse is the first pulse generated after the Pretrigger pulse.

3. Set the PULSE WIDTH switch to obtain the desired pulse width of the output video signals. This switch effects all output video signals simultaneously.

4. By adjusting the amplitude control under each video output connector, set each video output pulse to the amplitude desired.

4-12. The pulse generator is now properly set.

4-13. STOPPING PROCEDURE

4-14. To turn off the Pulse Generator perform the following procedures.

1. Place the Power ON/OFF switch in the OFF position, and observe that the power indicator is extinguished.

2. Remove the input power cable from the 105 to 130 vac, 60 hz outlet and disconnect the Pulse Generator from the equipment under test.

SECTION III
EMERGENCY OPERATION

(Not Applicable)

CHAPTER 5

THEORY OF OPERATION

5-1. INTRODUCTION. This chapter presents the theory of operation for the Pulse Generator and is divided into three sections. Section I discusses the Functional System Operation. The Functional Operation of Electronic Circuits is presented in Section II. Section III, Functional Operation of Mechanical Assemblies, is not applicable.

SECTION I
FUNCTIONAL SYSTEM OPERATION

5-2. GENERAL DESCRIPTION

5-3. The Pulse Generator provides six pulse outputs all generated internally and none of which are coincident. The timing of five pulse outputs is referenced to the start of the pretrigger pulse output. The repetition rate of the pretrigger pulse and therefore the succeeding five pulses, may be controlled either internally by varying the FREQ control on the front panel or by an external source connected to the TRIG IN Connector. The external trigger overrides the manual front panel control. The start of the MTI pulse out with reference to the PRE-TRIG OUT Pulse can be varied from 30 to 150 microseconds, after the start of the pre-trigger pulse, by the DELAY control on the front panel. Each of the other four pulses is delayed approximately five microseconds from one to the other starting with the MTI pulse, then NORM, IFF, MAP and SPARE. See Figure 5-1.

5-4. OSCILLATOR, PRETRIGGER AND VIDEO DELAY SUBASSEMBLY

5-5. This subassembly contains the oscillator used to generate the Pretrigger and its timing. The oscillator serves as the only timing for all of the delay periods between the MTI, NORM, IFF, MAP and SPARE pulses, hereinafter referred to as video pulses. This subassembly provides the timing for the video generator subassembly.

5-6. VIDEO GENERATOR AND LINE DRIVER SUBASSEMBLY

5-7. This subassembly contains five identical circuits used to generate the five video pulses. The width of each pulse output can be changed by the front panel PULSE WIDTH switch. Only two pulse widths, 0.8 μsec and 300 μsec, are provided.

5-8. POWER SUPPLY SUBASSEMBLY

5-9. This subassembly provides +5 volts and +10 volts needed for all circuits.

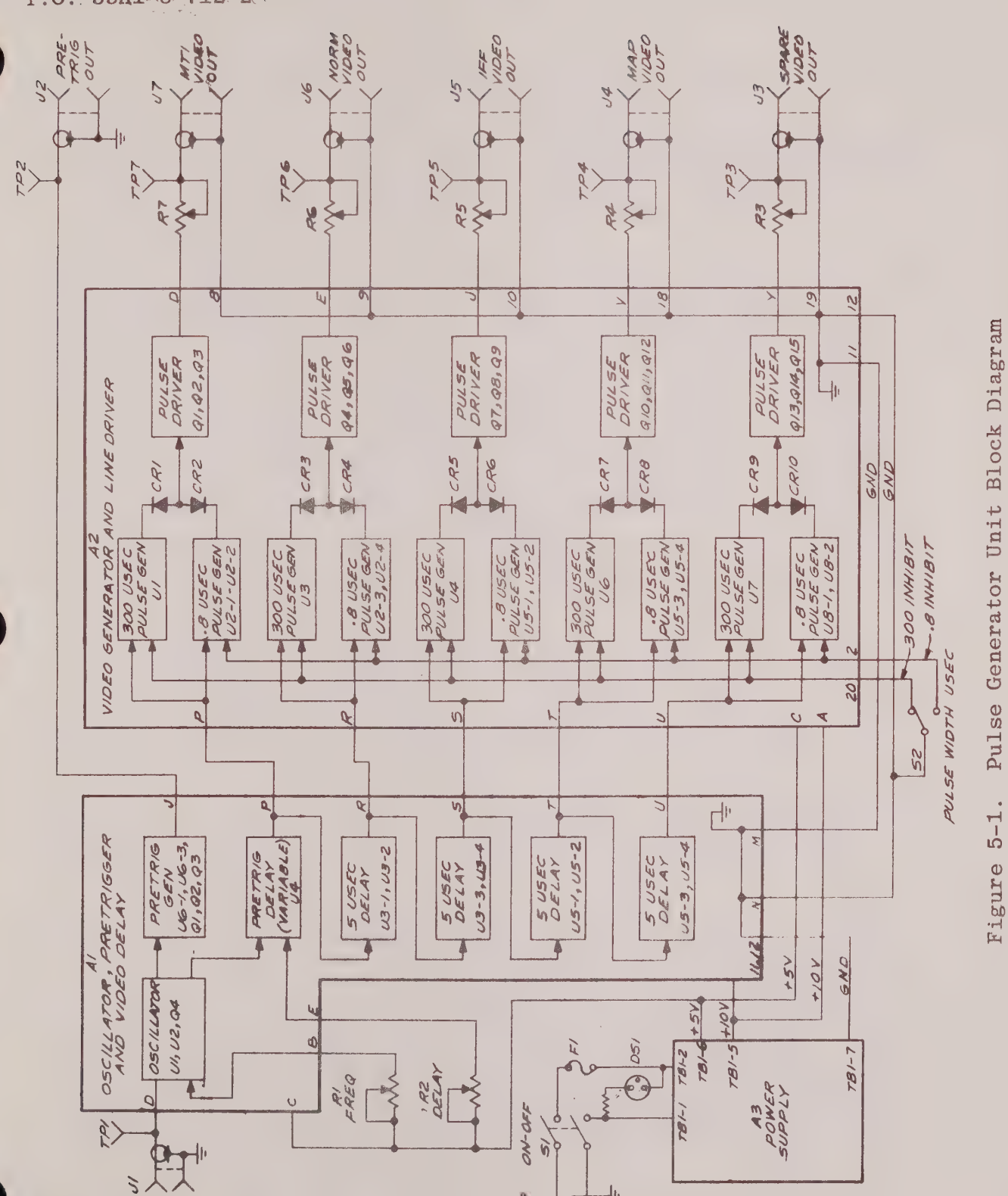


Figure 5-1. Pulse Generator Unit Block Diagram

SECTION II
FUNCTIONAL OPERATION OF ELECTRONIC CIRCUITS

5-10. GENERAL. In order to fully understand the discussion in this section refer to the applicable circuit diagrams in Chapter 7.

5-11. OSCILLATOR, PRETRIGGER AND VIDEO DELAY ASSEMBLY A1. - See figure 7-2.

5-12. This subassembly generates the timing for the pretrigger and video pulses. U1 and U2 are two monostables connected to make a free running oscillator. The frequency of this oscillator is controlled by the FREQ control, 1R1, on the front panel which changes the on time of U1 after it is triggered by U2. The frequency of the oscillator can also be controlled by an external positive pretrigger in pulse at pin D through emitter follower Q4. Whenever the external trigger is used, pin 5 of U1 is held low which inhibits U1. Therefore the external trigger only effects U2 triggering time. U2 on time, after triggering, is controlled by C5 and R7 and is approximately 370 microseconds. When U2 is triggered by either a positive edge pulse on pin 5 or a negative edge on pins 3 and 4, pin 1 of U2 goes low and stays low for approximately 370 microseconds. This negative edge excursion, applied to differentiator C6 and R9, triggers the pulse shaper.

5-13. The pulse shaper is made up of NAND gates U6-1, U6-3 and R10, C7 and R11. A negative going trigger at pin 1 U6-1 starts the timing of the pulse shaper by causing the output of U6-1 at pin 3 to go high. The duration of the positive pulse at pin 3 of U6-1 is also the pulse width of the pretrigger out at XA1-J and is controlled by R10, C7 and R11. The positive pulse at pin 3 of U6-1 is applied to the output driver consisting of Q1, Q2 and Q3.

5-14. Q1 is an inverter that drives Q2 and Q3. Q2 presents low impedance to the output during the positive excursion of the output pulse and Q3 presents low impedance to the output during the negative excursion.

5-15. The output of the oscillator at pin 1 of U2 is also applied to U4 which is another monostable. The negative edge of the pulse at pins 3 and 4 of U4 triggers U4. The duration of the positive pulse at pin 6 of U4 is variable and controlled by the DELAY control 1R2 on the front panel and R17 and C12. This one shot U4 is used to delay the start of the video pulse from the leading edge of the Pretrigger pulse by approximately 30 to 150 microseconds. The positive pulse at Pin 6 of U4, designated T1, is used on the video generator board A2, to trigger the pulse generator for MTI video and also to trigger the pulse delay circuit made up of U3-1, R20, C14, R21 and U3-2.

5.16. The four pulse delay circuits shown are identical and operate the same as described in paragraph 5-13 for the pulse shaper. Each pulse delay is triggered by the negative excursion, lagging edge, of the positive pulse at its input. The input pulse to the pulse delays are T1, T2, T3 and T4. Therefore, each pulse delay output pulse starts after the end of the preceding pulse delay. Each positive pulse duration, T2, T3, T4 and T5 is set at approximately five microseconds whereas T1 positive pulse duration is variable from 30 to 150 microseconds.

5-17. VIDEO GENERATOR AND LINE DRIVER - ASSEMBLY A2. See figure 7-3.

5-18. This subassembly has five identical channels to generate five video pulses, MTI, Normal, IFF, Map and Spare respectively. Each pulse is delayed from the pretrigger pulse and from each other by T1, T2, T3, T4 and T5 respectively. Each channel contains a 300 microsecond pulse generator, a 0.8 microsecond pulse shaper, an OR circuit, an inverter and an output driver. The description of one channel will be the same for the other four.

5-19. U1 is a monostable used to generate the 300 microsecond video pulse controlled by C1 and R2. U1 is triggered by the lagging edge (negative excursion) of T1 positive pulse. If the 300 microsecond inhibit line at XA2-20 goes low (ground), U1 will be inhibited. The inhibit line at XA2-2 is activated by the PULSE WIDTH Switch, 1S1, on the front panel. If the 300 microsecond inhibit line goes low, the 0.8 microsecond inhibit line at XA2-2 which was low, goes high. This in turn permits T1 pulse to activate the pulse shaper via pin 1 of U2-1. This pulse shaper consisting of NAND gates U2-1 and U2-2, and C3 and R6 generates a 0.8 microsecond video pulse, the width of which is controlled by C3 and R6.

5-20. If neither the pulse generator nor the pulse shaper is triggered, then the anodes of CR1 and CR2 are high (plus voltage). These two diodes with R7 constitute an OR gate. Whenever either the generator or shaper respectively is triggered, the CR1 or CR2 anode goes low (ground) for the duration of the pulse interval.

5-21. The OR circuit drives inverter Q1 and one half of output driver Q3. Q1 in turn drives the other half of the output driver Q2. At Q2 emitter connected to Q3 collector a positive pulse is coupled to an amplitude control 1R7, on the front panel.

5-22. POWER SUPPLY - ASSEMBLY A3. - See Figure 7-4.

5-23. The power supply is a transformer input T1, full wave rectifier CR1, 2, 3 and 4, the output of which is filtered by C3. The unregulated voltage at E3 is applied to voltage regulator VR1 to generate +10 volts dc regulated. The regulated 10 volts is further regulated down to +5 volts dc by VR2.

SECTION III
FUNCTIONAL OPERATION OF MECHANICAL ASSEMBLIES

(Not Applicable)

CHAPTER 6

MAINTENANCE

6-1. INTRODUCTION. This chapter is divided into three sections containing information and instructions to enable maintenance personnel to determine fault isolation to the lowest replaceable level. Section I contains organizational/field maintenance. Section II, Special Maintenance, is not applicable. Section III contains performance test checks to insure that the equipment meets minimum performance standards.

SECTION I
ORGANIZATIONAL/FIELD MAINTENANCE

6-2. GENERAL

6-3. This section contains all data required for the maintenance of the Pulse Generator, at organizational and intermediate levels, and supplements the performance test checks of Section III.

WARNING

This equipment is operated at voltages which are hazardous to human life. 120 vac are applied to the primary of the power transformer via the 3-wire power cord. Use care when operating the Pulse Generator with the power components exposed.

6-4. TROUBLESHOOTING. The probable causes of troubles during on-line operation can usually be isolated to a faulty plug-in circuit board. It is suggested that the performance test checks of Section III be performed to assist in isolating any faults to a subassembly prior to individual subassembly check out.

6-5. MAINTENANCE SUPPORT EQUIPMENT

6-6. All test equipment required for organizational and field maintenance, a brief description and the operating characteristics of that equipment is presented in table 6-1.

Table 6-1. Maintenance Test Equipment (or equivalent)

TEST EQUIPMENT	FSN	CHARACTERISTICS
AN/PSM6A	6625-656-5871	DC Voltage: 0-1000v at 20,000 ohms/volt sensitivity AC Voltage: 0-1000v at 5,000 ohms/volt sensitivity DC Current: 0-10 amperes DC Resistance: 0-10 megohms
Oscilloscope, Tektronix 453	6625-430-6637	VERTICAL (2 identical channels) BANDWIDTH & RISETIME 10 V/dv to 20 mV/div: DC to 50 MHz, 7 ns 10 mV/div: DC to 45 MHz, 7.8 ns 5 mV/div: DC to 40 MHz, 8.75 ns CALIBRATED DEFLECTION FACTOR 5 mV/div to 10 V/div. 50 mV/div to 100 V/div with P6010 Probe. INPUT RC---1 megohm paralleled by approx 20 pF HORIZONTAL CALIBRATED TIME BASE-- 0.1 µs/div to 5 s/div. X10 MAGNIFIER--Operates over full time base, increases fastest rate to 10 ns/div CALIBRATED SWEEP DELAY--- 1 µs to 50 s. CRT DISPLAY AREA---6 x 10 div (0.8 cm/div)
Probe, Voltage Tektronix P6010		Attenuation: 10 X
Extender Card	6625-MC600553 PZK	22 Pin Connector

6-7. PERFORMANCE TEST STANDARDS

6-8. The system performance test standards prepared for organizational/field level maintenance of this Pulse Generator are based on examination of waveforms at critical points of each sub-assembly. The waveforms shown in the performance test tables (tables 6-2 through 6-3) represent photographs taken while the system components were in operating condition. Pertinent characteristics, together with acceptable tolerances when necessary, are given under the heading PERFORMANCE STANDARDS. Where critical maximum and/or minimum values are not given in the PERFORMANCE STANDARDS column, the indicated value in this column is typical for the average component and may vary between sub-assemblies due to inherent circuit differences.

6-9. The tests described in the performance test tables are arranged in the order of signal flow through the unit under test. With the tests arranged in a signal flow sequence, troubles may more readily be isolated to a specific component or circuit. When using the performance test standards tables, the control settings should not be changed unless changes are called for under the heading CONTROL SETTINGS AND OPERATION OF EQUIPMENT.

6-10. Some of the subassemblies under test will have to be operated out of the card nest (an extender card) in order to gain access to testpoints. Refer to table 6-1 for the extender card necessary to connect the component being tested. The Pulse Generator assembly should be removed from the case for testing and then replaced after testing.

6-11. The performance test checks in Section III, if performed before using the performance test standards, will assist isolation of any given problem to a subassembly. All voltages and wave forms were taken on one single unit.

6-12. Prior to performing the tests in table 6-2, refer to the following preliminary instructions.

6-13. PRELIMINARY INSTRUCTIONS FOR TABLE 6-2 PERFORMANCE TESTS

1. Connect A1 to an extender card to make components accessible.
2. Turn FREQ control fully CW.
3. Turn DELAY control fully CCW.
4. Set PULSE WIDTH switch to 0.8.
5. Set all five Video output pulse gain controls fully CW.

6. Terminate all Outputs using a 75 ohm termination.

7. Turn on power.

8. While testing this subassembly refer to Figure 7-2 to locate the point of test referred to in the procedure.

Table 6-2. Performance Standards for the Oscillator, Pretrigger and Video Delay Sub-Assembly A1 (See paragraph 6-12)

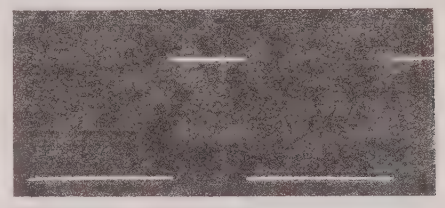
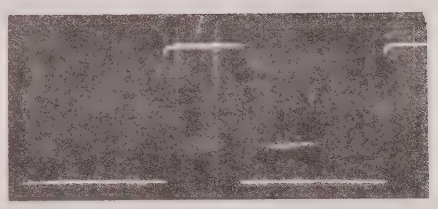
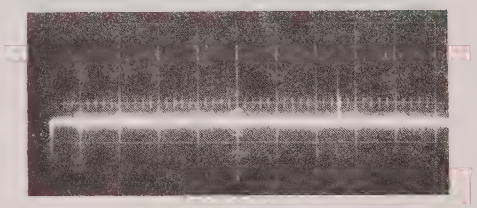
STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARDS
1	Note: Oscilloscope settings will be noted only if there is a change from the previous step. Sync Oscilloscope external negative using the signal at test point A2. Oscilloscope Setting: Vertical: 1 V/cm Horizontal: 100 µ sec/cm	(A2)		The following waveforms in this column are representative of those to be seen at the points of test noted with the test equipment and assembly under test set up as explained.  GND: Bottom line
2		(A1)		 GND: Bottom line
3	Oscilloscope Set-Setting: Vertical: 2 V/cm Horizontal: 50µ sec/cm	(A3)		 GND: Bottom line

Table 6-2. Performance Standards for the Oscillator, Pretrigger and Video Delay Sub-Assembly A1 (cont.)

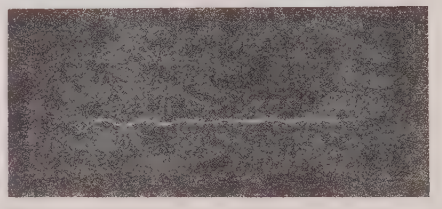
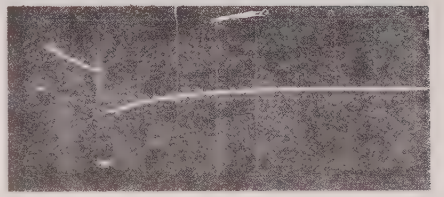
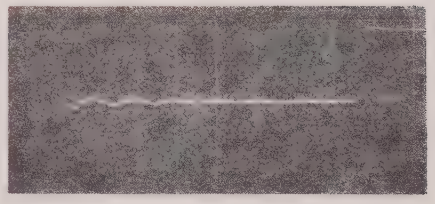
STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARDS
4	Oscilloscope Setting: Horizontal: 0.1μ sec/cm	(A4)		 GND: Bottom line
5	Oscilloscope Setting: Horizontal: 0.5μ sec/cm	(A5)		 GND: Center line
6	Oscilloscope Setting: Horizontal: 0.1μ sec/cm	(A6)		 GND: Center line

Table 6-2. Performance Standards for the Oscillator, Pretrigger and Video Delay Sub-Assembly A1 (cont.)

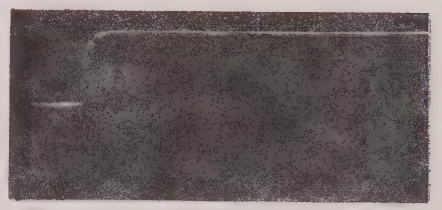
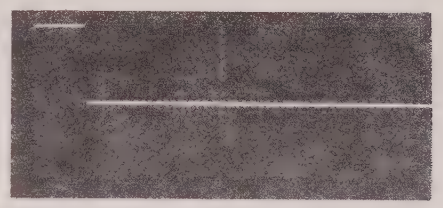
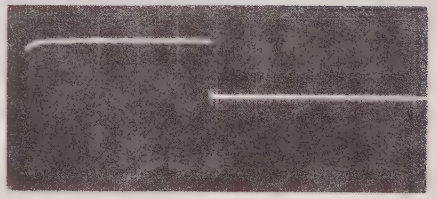
STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARDS
7	Oscilloscope Setting: Vertical: 5V/cm Horizontal: 1μ sec/cm	A7		 GND: Center line
8		A8		 GND: Center line
9	Sync Oscilloscope external, positive, using positive pulse at test point A9 Oscilliscope Settings: Vertical: 2V/cm Horizontal: 5μ sec/cm	A9		 GND: Center line

Table 6-2. Performance Standards for the Oscillator, Pretrigger and Video Delay Sub-Assembly A1 (cont.)

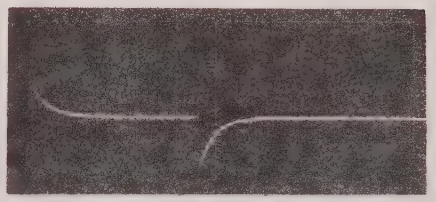
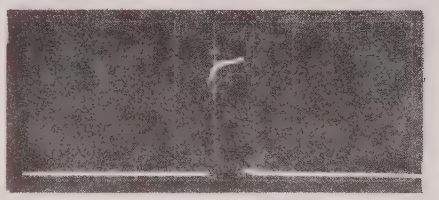
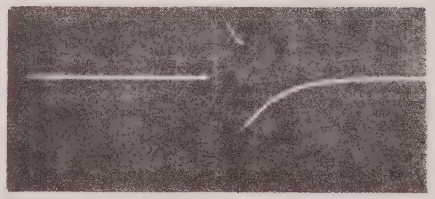
STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARDS
10		(A10)		 GND: Bottom line
11	Oscilloscope Setting: Vertical: 1V/cm	(A11)		 GND: Bottom line
12		(A12)		 GND: Center line

Table 6-2. Performance Standards for the Oscillator, Pretrigger and Video Delay Sub-Assembly A1 (cont.)

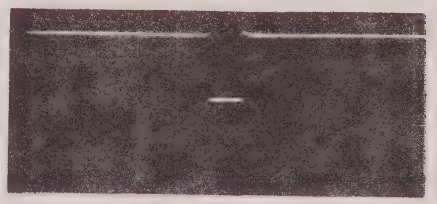
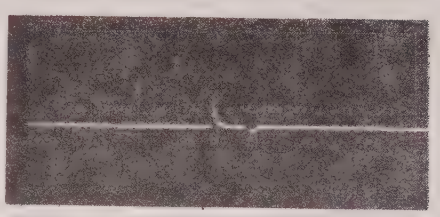
STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARDS
13	Oscilloscope Setting: Vertical: 2V/cm	(A13)		 GND: Center line
14		(A14)		 GND: Bottom line
15	Oscilloscope Setting: Vertical: 1V/cm	(A15)		Same as Step 11 except time delayed by 5μ sec.
16		(A16)		Same as Step 12 except time delayed by 5μ sec.
17	Oscilloscope Setting: Vertical: 2V/cm	(A17)		Same as Step 13 except time delayed by 5μ sec.
18		(A18)		Same as Step 14 except time delayed by 5μ sec.

Table 6-2. Performance Standards for the Oscillator, Pretrigger and Video Delay Sub-Assembly A1 (cont.)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTING AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARDS
19	Oscilloscope Setting: Vertical: 1V/cm	A19		Same as Step 11 except time delayed by 10μ sec.
20		A20		Same as Step 12 except time delayed by 10μ sec.
21	Oscilloscope Setting: Vertical: 2V/cm	A21		Same as Step 13 except time delayed by 10μ sec.
22		A22		Same as Step 14 except time delayed by 10μ sec.
23	Oscilloscope Setting: Vertical: 1V/cm	A23		Same as Step 11 except time delayed by 15μ sec.
24		A24		Same as Step 12 except time delayed by 15μ sec.
25	Oscilloscope Setting: Vertical: 2V/cm	A25		Same as Step 13 except time delayed by 15μ sec.
			Turn power off, remove extender card and replace sub-assembly A1.	

6-14. Prior to performing the tests in table 6-3, refer to the following preliminary instructions.

6-15. PRELIMINARY INSTRUCTIONS FOR TABLE 6-3 PERFORMANCE TESTS

1. Connect A2 to an extender card to make components accessible.

2. Turn FREQ control fully CW.

3. Turn DELAY control fully CCW.

4. Set PULSE WIDTH switch to 0.8.

5. Set all five video output pulse amplitude controls fully CW.

6. Terminate all outputs using a 75 ohm termination.

7. Turn on Power.

8. While testing this subassembly, refer to figure 7-3 to locate the point of test referred to in the procedure.

9. There are five identical channels on this subassembly. Therefore, standards for one channel only will be shown, to be applicable to any channel. The waveforms shown were taken through the MTI video channel.

Table 6-3. Performance Standards for the Video Generator and Line Drive Sub-Assembly A2 (See paragraph 6-14)

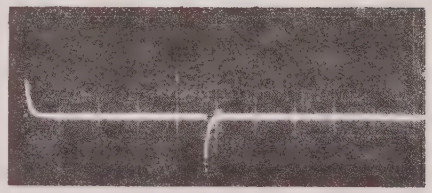
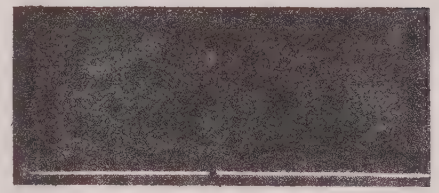
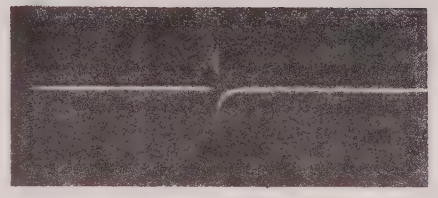
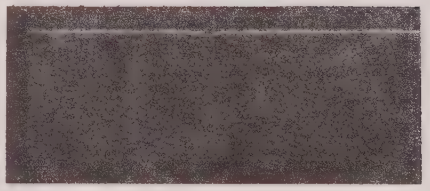
STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARDS
1	Sync the oscilloscope external, positive, using positive pulse at test point A1. Oscilloscope Settings: Vertical: 2V/cm Horizontal: 5μsec/cm	(A1)		The following waveforms in this column are representative of those to be seen at the points of test noted with the test equipment and assembly under test set up as explained. GND: Center line
2		(A2)		 GND: Bottom line

Table 6-3. Performance Standards for the
Video Generator and Line Drive Sub-Assembly A2 (cont.)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARDS
3	Oscilloscope Setting: Vertical: 1V/cm	(A3)		 GND: Bottom line
4	Oscilloscope Setting: Vertical: 2V/cm	(A4)		 GND: Center line
5		(A5)		 GND: Center line

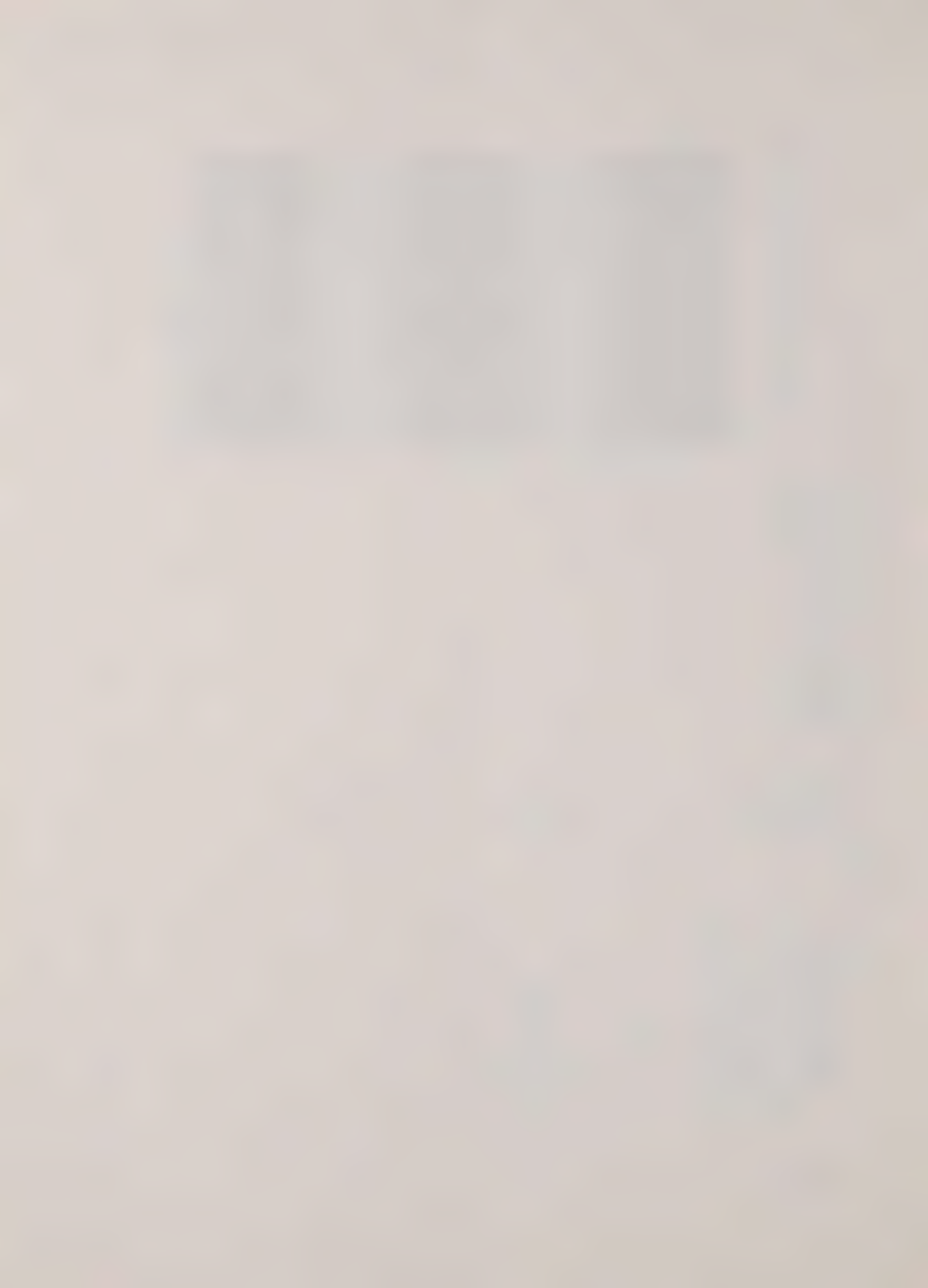


Table 6-3. Performance Standards for the
Video Generator and Line Drive Sub-Assembly A2 (cont.)

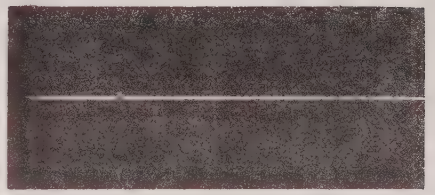
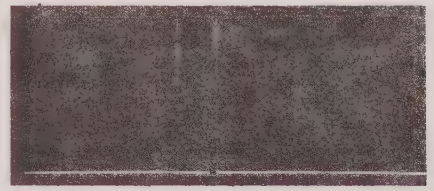
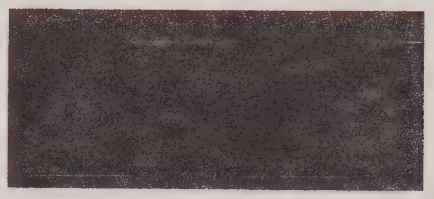
STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARDS
6	Oscilloscope Setting: Vertical: 0.5V/cm	(A6)		 GND: Center line
7	Oscilloscope Settings: Vertical: 5V/cm Horizontal: 10µ sec/cm	(A7)		 GND: Center line
8	Oscilloscope Setting: Vertical: 2V/cm Horizontal: 5µ sec/cm	(A8)		 GND: Bottom line Positive pulse width: 0.8µ sec. ± 0.2µ sec.

Table 6-3. Performance Standards for the
Video Generator and Line Drive Sub-Assembly A2 (cont.)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARDS
9	Oscilloscope Settings: Vertical: 1V/cm Horizontal: 100µ sec/cm	(A9)	Set PULSE WIDTH switch to 300 position.	 GND: Bottom line Negative pulse width: 300µ sec ± 30µ sec.
			Turn power off, remove extender card and replace subassembly.	

SECTION II

SPECIAL MAINTENANCE

(Not Applicable)

SECTION III

PERFORMANCE TEST CHECKS

6-16. This section contains performance test checks that give minimum standards of performance under normal operating conditions, with permissible tolerances, and allows maintenance personnel to compare actual test results with standards to determine whether or not the equipment is operating properly. These checks will also assist in initial trouble shooting to isolate a problem to a particular subassembly.

6-17. Figure 6-1 should be referred to during these checks.

6-18. All testing will be performed at connectors or test points on the front panel.

6-19. Prior to performing the tests in table 6-4, refer to the following preliminary instructions.

6-20. PRELIMINARY INSTRUCTIONS FOR TABLE 6-4 PERFORMANCE TESTS

1. All connection points made on the Pulse Generator during these tests are located on the front panel.
2. On the Pulse Generator, connect a 75 ohm termination to each of the five video output coax jacks.
3. Turn all five video gain controls fully clockwise (CW).
4. Set PULSE WIDTH switch to 0.8 microseconds.

5. Set FREQ control and DELAY control fully clockwise (CW).

6. Use the external sync and Delaying sweep features of the oscilloscope. Sync the oscilloscope with the PRE-TRIG OUT which is a positive pulse by connecting a coax cable between Pulse Generator and oscilloscope. Terminate the cable at the oscilloscope end using a 75 ohm termination.

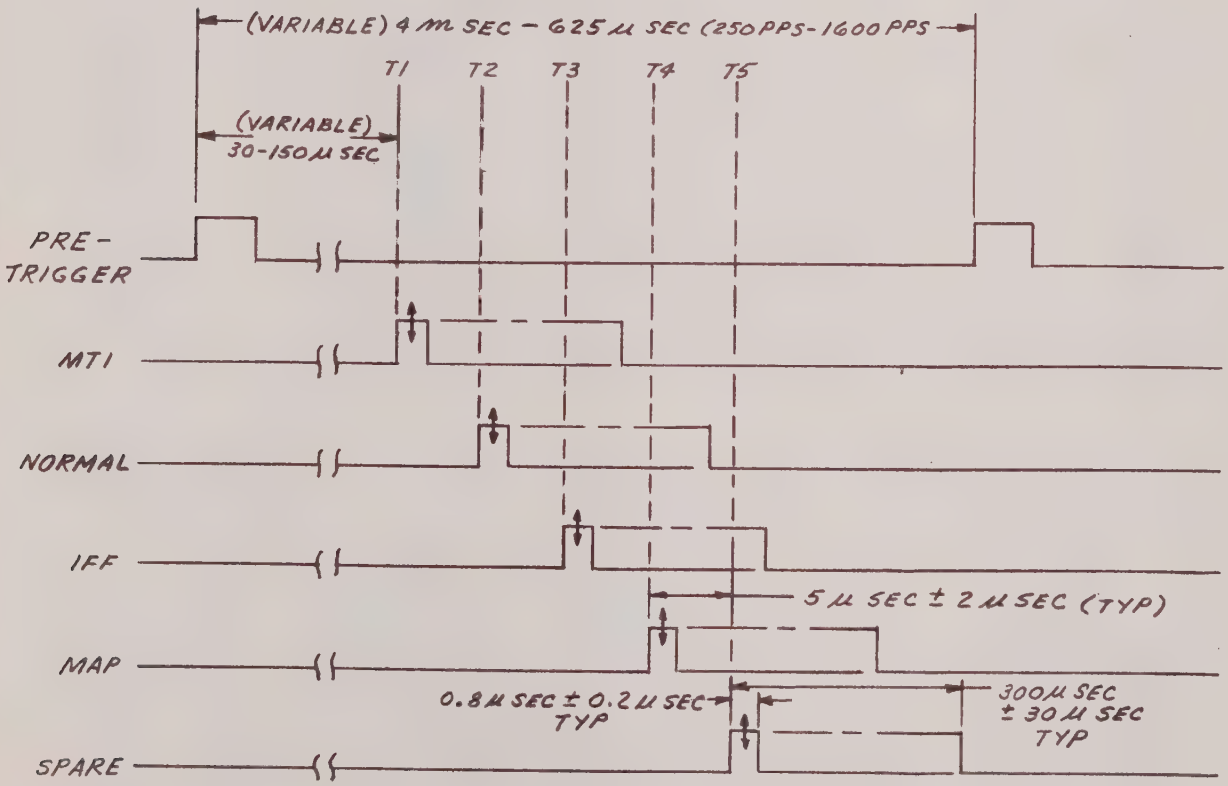


Figure 6-1. Timing Diagram

Table 6-4. Performance Test Checks (See paragraph 6-19)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARDS
1	Connect oscilloscope input channel #1 to 1TP2	1TP2 Pretrig out		Pulse Width: 2 µsec + 1 µsec Amplitude: 7.5 v minimum 10 volts maximum Rise Time: 100 nsec maximum
2	Adjust oscilloscope sweep time to observe two pretrigger pulses. Measure the time between pulse-leading edge to leading edge.		Turn the FREQ Control fully ccw, measure the pulse spacing. Then turn the FREQ Control fully cw and again measure the pulse spacing.	Pulse Spacing minimum Range (PRF): 4 milliseconds to 6.25 microseconds 625 µsec (250 pps to 1600 pps)
3	Connect oscilloscope input channel #2 to 1TP7 and measure the MTI pulse.	1TP7 MTI Video Pulse Out	Turn MTI amplitude adjust fully ccw and measure pulse amplitude. Turn MTI amplitude adjust fully cw and measure pulse parameters.	Amplitude Range: 1.0v to 3.5v Pulse Width: 0.8 ±0.2 microsecond Rise Time: less than 80 nanoseconds Overshoot: less than 10%
4		1TP7	Set PULSE WIDTH Switch to 300 and make measurements	Amplitude Range: 1.0v to 3.5v Pulse Width: 300 ±30 microseconds Rise Time: less than 80 nanoseconds Droop: less than 10%
5	Observe the time between the leading edge of the Pretrigger pulse on channel 1 and the leading edge of the MTI pulse on channel 2	1TP2 Pre-Trig Pulse	Turn DELAY Control fully ccw and make measurement.	Minimum Delay Time range between pretrigger pulse and MTI Video Pulse: 30 to 150 microseconds
		1TP7 MTI Pulse	Turn DELAY Control fully cw and make a measurement.	

Table 6-4. Performance Test Checks (cont.)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARDS
6	Connect oscilloscope channel 1 to 1TP6	1TP6 Normal Video Pulse Out	Turn NORM amplitude adjust fully ccw and measure pulse amplitude. Turn MTI amplitude adjust fully cw and measure pulse parameters.	Amplitude Range: 1.0V to 3.5V Pulse Width: 300 ±30 microseconds Rise Time: less than 80 nanoseconds Droop: less than 10%
7		1TP6	Set PULSE WIDTH switch to 0.8 and make measurements.	Amplitude Range: 1.0V to 3.5V Pulse Width: 0.8 ± 0.2 microseconds Rise Time: less than 80 nanoseconds Overshoot: less than 10%
8	Observe the time between the leading edge of the MTI pulse on channel 2 and the leading edge of the NORMAL pulse on channel 1	1TP7 1TP6		Delay Between Pulses: 5 ± 2 microseconds
9	Connect oscilloscope channel 2 to 1TP5	1TP5 IFF Video Pulse Out	Turn IFF amplitude adjust fully ccw and measure pulse amplitude. Turn IFF amplitude adjust fully cw and measure pulse parameters.	Amplitude Range: 1.0V to 3.5V Pulse Width: 0.8 ± 0.2 microseconds Rise Time: less than 80 nanoseconds Overshoot: less than 10%
10		1TP5	Set PULSE WIDTH Switch to 300 and make measurements.	Amplitude Range: 1.0V to 3.5V Pulse Width: 300 ± 30 microseconds Rise Time: less than 80 nanoseconds Droop: less than 10%

Table 6-4. Performance Test Checks (cont.)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARDS
11	Observe the time between the leading edge of the Normal pulse on channel 1 and the leading edge of the IFF pulse on channel 2	1TP6 1TP5		Delay Between Pulses: 5 ± 2 microseconds
12	Connect oscilloscope channel 1 to 1TP4	1TP4 Map Video Pulse Out	Turn Map amplitude adjust fully ccw and measure pulse amplitude. Turn Map amplitude adjuse fully cw and measure pulse parameters.	Amplitude Range: 1.0V to 3.5V Pulse Width: 300 ± 30 microseconds Rise Time: less than 80 nanoseconds Droop: less than 10%
13		1TP4	Set PULSE WIDTH Switch to 0.8 and make measurements.	Amplitude Range: 1.0V to 3.5V Pulse Width: 0.8 ± 0.2 microseconds Rise Time: less than 80 nanoseconds Overshoot: less than 10%
14	Observe the time between the leading edge of the IFF pulse on channel 2 and the leading edge of the Map pulse on channel 1	1TP5 1TP4		Delay between pulses: 5 ± 2 microseconds

Table 6-4. Performance Test Checks (cont.)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARDS
15	Connect oscilloscope channel 2 to 1TP3	1TP3 Spare Video Pulse Out	Turn Spare amplitude adjust fully ccw and measure pulse amplitude. Turn Spare amplitude adjust fully cw and measure pulse parameters.	Amplitude Range: 1.0V to 3.5V Pulse Width: 0.8 ± 0.2 microseconds Rise Time: less than 80 nanoseconds Overshoot: less than 10%
16		1TP3	Set PULSE WIDTH Switch to 300 and make measurements.	Amplitude Range: 1.0V to 3.5V Pulse Width: 300 ± 30 microseconds. Rise Time: less than 80 nanoseconds Droop: less than 10%
17	Observe the time between the leading edge of the Map pulse on channel 1 and the leading edge of the Spare pulse on channel 2	1TP4 1TP3		Delay between pulses: 5 ± 2 microseconds

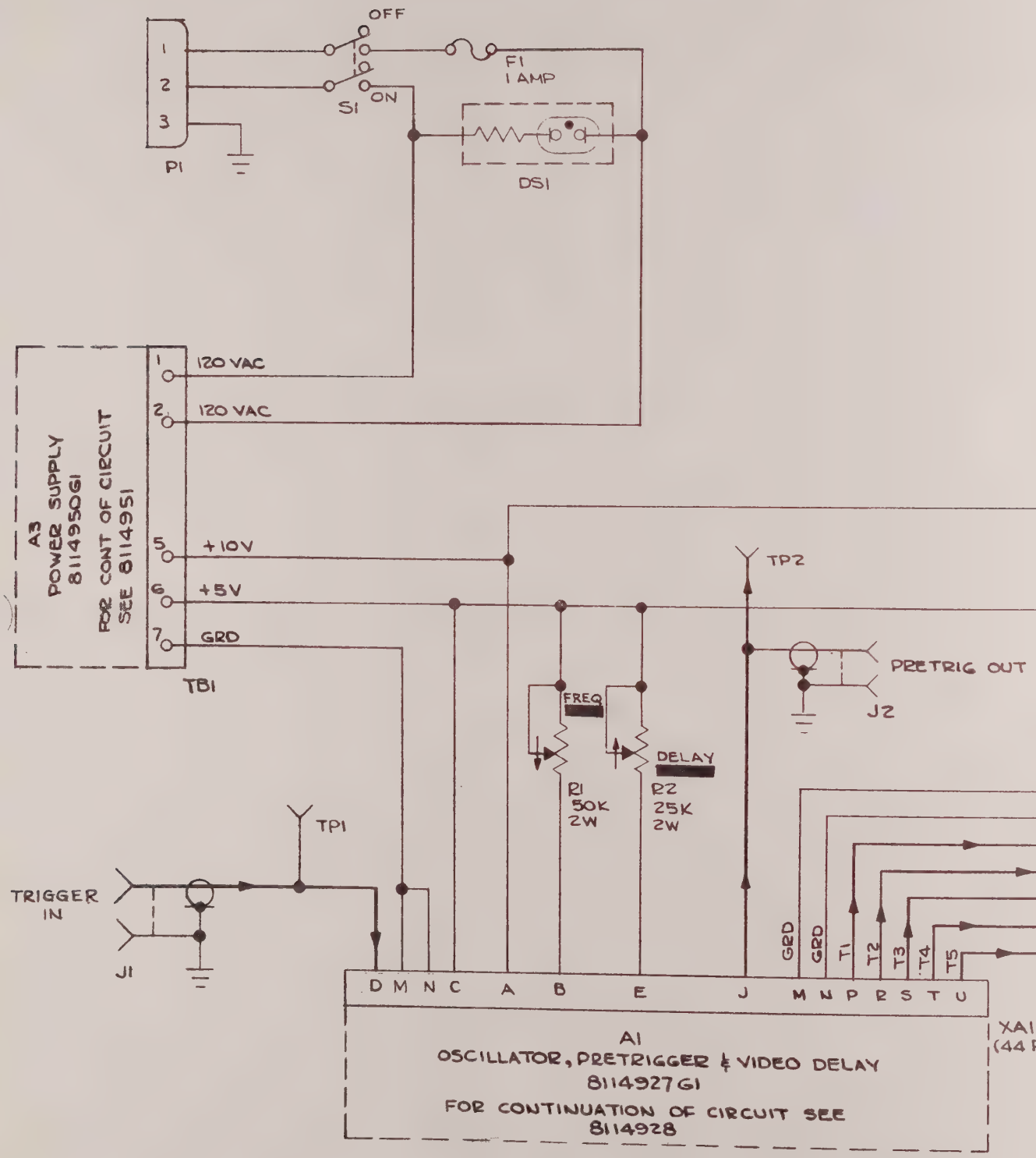
CHAPTER 7

CIRCUIT DIAGRAMS

7-1. INTRODUCTION. The purpose of this chapter is to provide operating and maintenance personnel with a complete set of electrical and electronic diagrams covering the Pulse Generator. These diagrams are intended for use in troubleshooting and maintenance of the equipment and should supplement the information in other chapters of this technical order.

7-2. SCOPE. An overall circuit diagram of the Pulse Generator is provided along with all individual schematics. A heavy line with arrows, on the schematics, indicates signal path and direction of signal flow. An encircled capital letter and an arabic numeral (A1) are used to identify and designate test points used in isolating causes of subnormal performance within a specific assembly or subassembly. The nomenclature of each variable control is underlined on the applicable schematic.

7-3. DIAGRAM ARRANGEMENT. The circuit diagram of the overall Pulse Generator assembly appears first succeeded by diagrams of the subassemblies in order of the corresponding equipment reference designation.


OFF
1
2
3
P1
S1
ON
F1
1 AMP
DS1
A3
POWER SUPPLY
8114950G1
FOR CONT OF CIRCUIT
SEE 8114951
1
2
5
6
7
120 VAC
120 VAC
+10V
+5V
GRD
TB1
TP2
PRETRIG OUT
J2
FREQ
DELAY
R1
50K
2W
R2
25K
2W
TP1
TRIGGER
IN
J1
D M N C A B E J M N P R S T U
GRD
GRD
T1
T2
T3
T4
T5
A1
OSCILLATOR, PRETRIGGER & VIDEO DELAY
8114927G1
FOR CONTINUATION OF CIRCUIT SEE
8114928

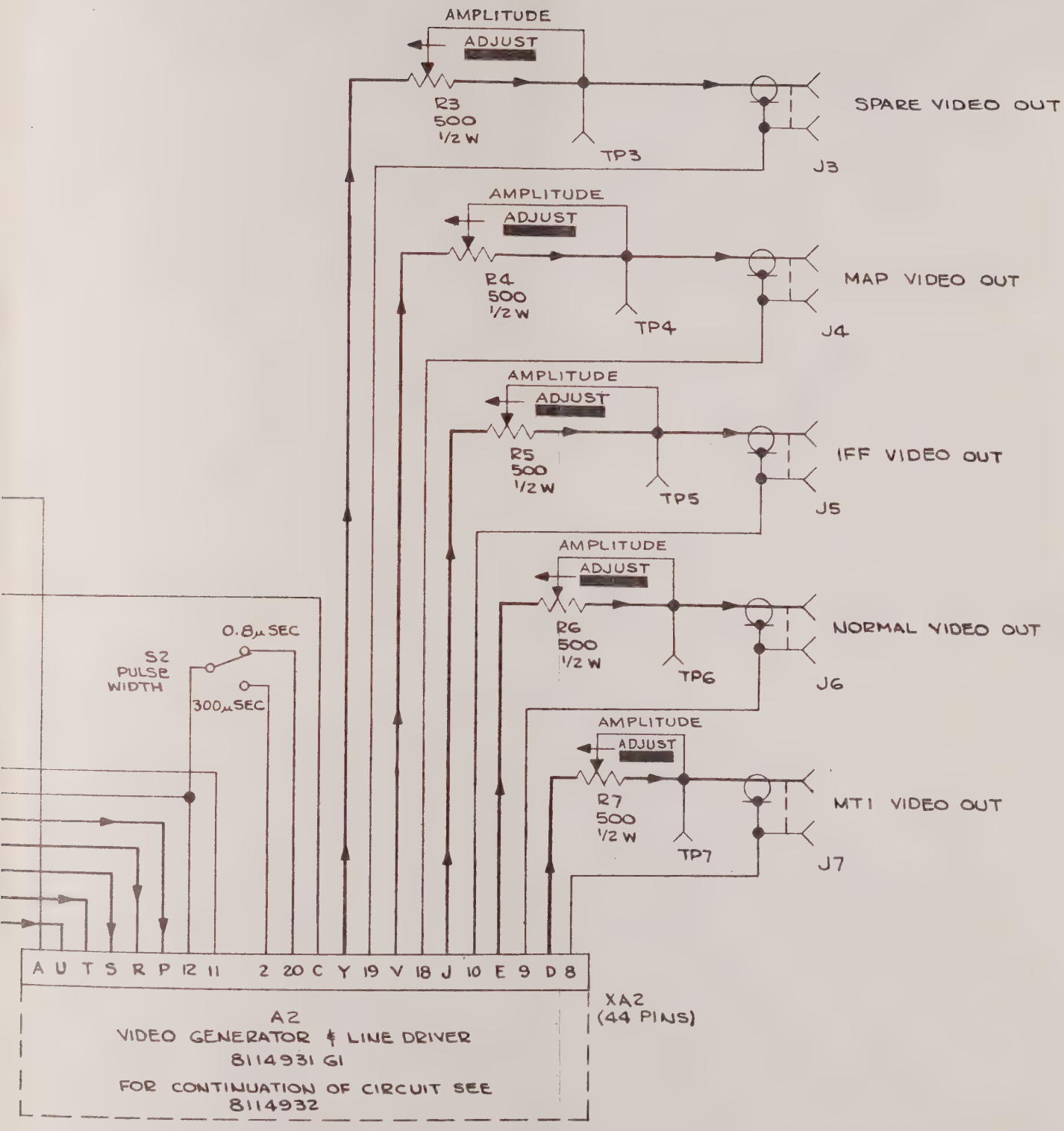
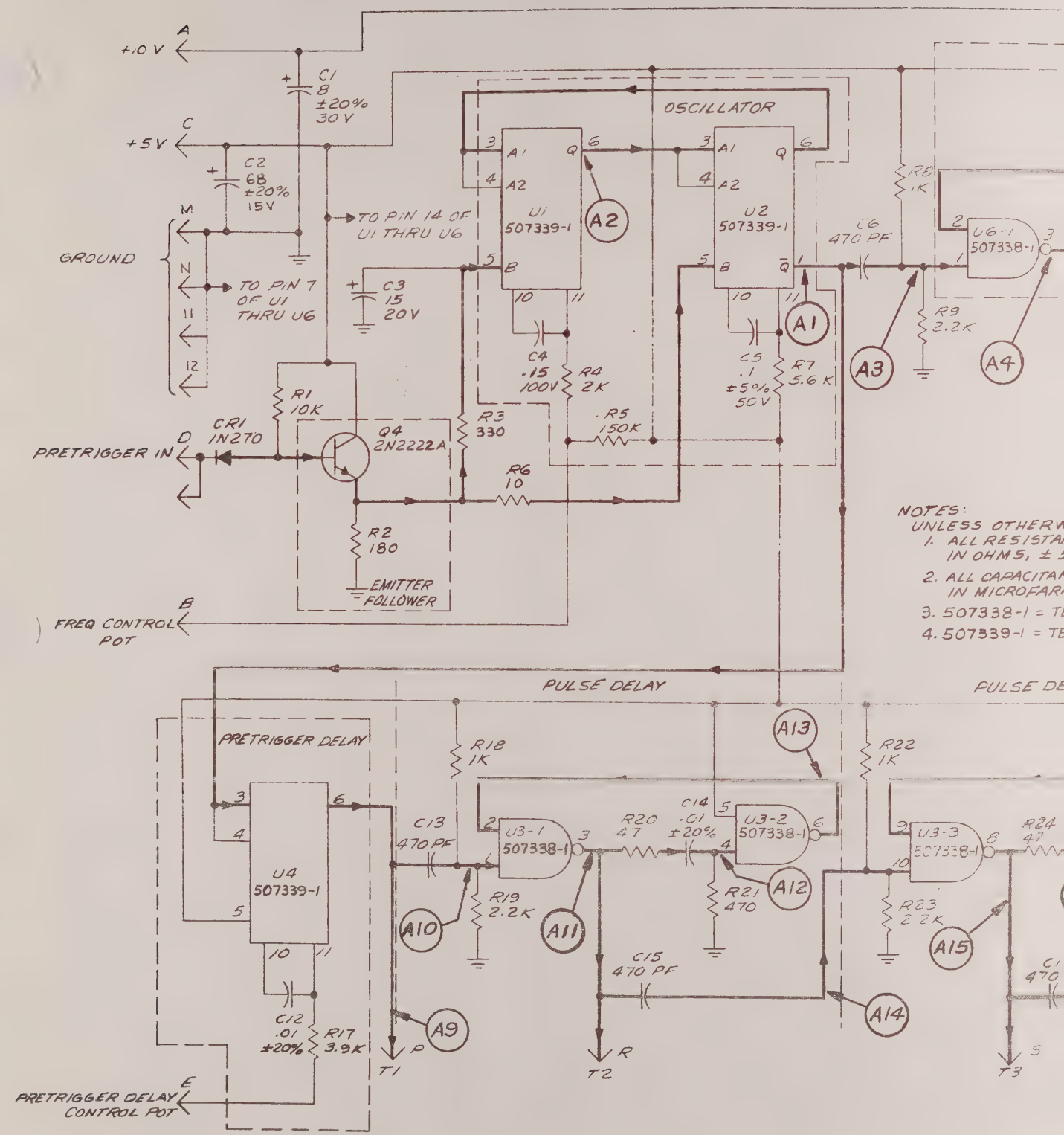
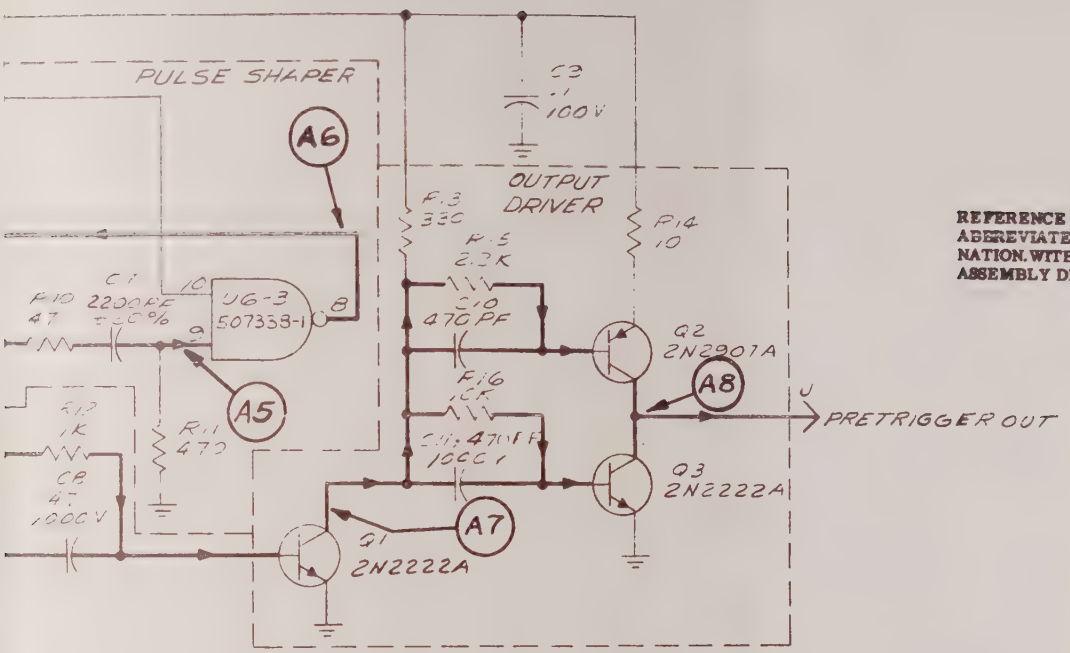


Figure 7-1. Pulse Generator, Schematic Diagram


+10 V
A
C1
8
±20%
30 V
+5V
C
C2
68
±20%
15V
M
N
11
12
GROUND
TO PIN 14 OF U1 THRU U6
TO PIN 7 OF U1 THRU U6
C3
15
20V
OSCILLATOR
U1
507339-1
U2
507339-1
A1
A2
A1
A2
A3
A4
R8
1K
C6
470 PF
U6-1
507338-1
R9
2.2K
C4
.15
100V
R4
2K
C5
.1
±5%
50V
R7
5.6 K
R5
150K
R1
10K
CR1
IN270
Q4
2N2222A
R3
330
R6
10
R2
180
EMITTER FOLLOWER
D
PRETRIGGER IN
B
FREQ CONTROL POT
NOTES:
UNLESS OTHERW
1. ALL RESISTA
IN OHMS, ±
2. ALL CAPACITA
IN MICROFAR
3. 507338-1 = T
4. 507339-1 = TE
PULSE DELAY
PULSE DE
PRETRIGGER DELAY
U4
507339-1
A13
R18
1K
R22
1K
C13
470 PF
U3-1
507338-1
R20
47
C14
.01
±20%
U3-2
507338-1
U3-3
507338-1
R24
47
R19
2.2K
R21
470
R23
2.2K
A10
A11
A12
A15
C15
470 PF
A14
C12
.01
±20%
R17
3.9K
A9
P
T1
R
T2
S
T3
E
PRETRIGGER DELAY CONTROL POT



ISE SPECIFIED:
CE VALUES ARE
%, 1/4W.
CE VALUES ARE
05, ±10%, 500V.
XAS INSTRUMENTS NO. SN7400N-00
KAS INSTRUMENTS NO. SN74121N-00

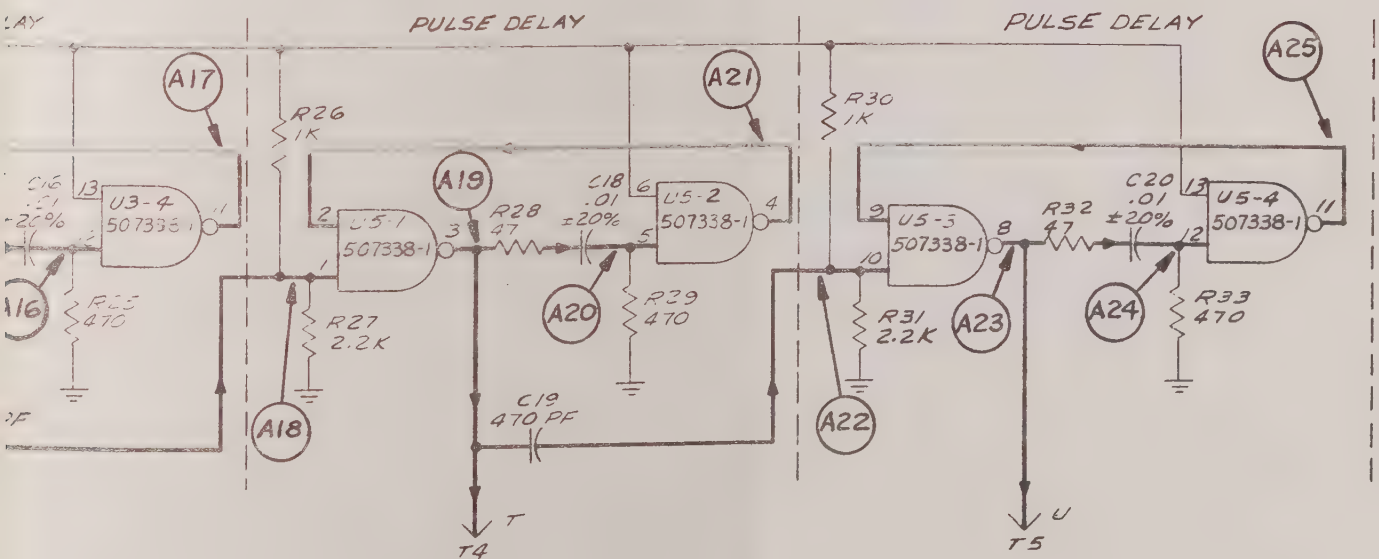
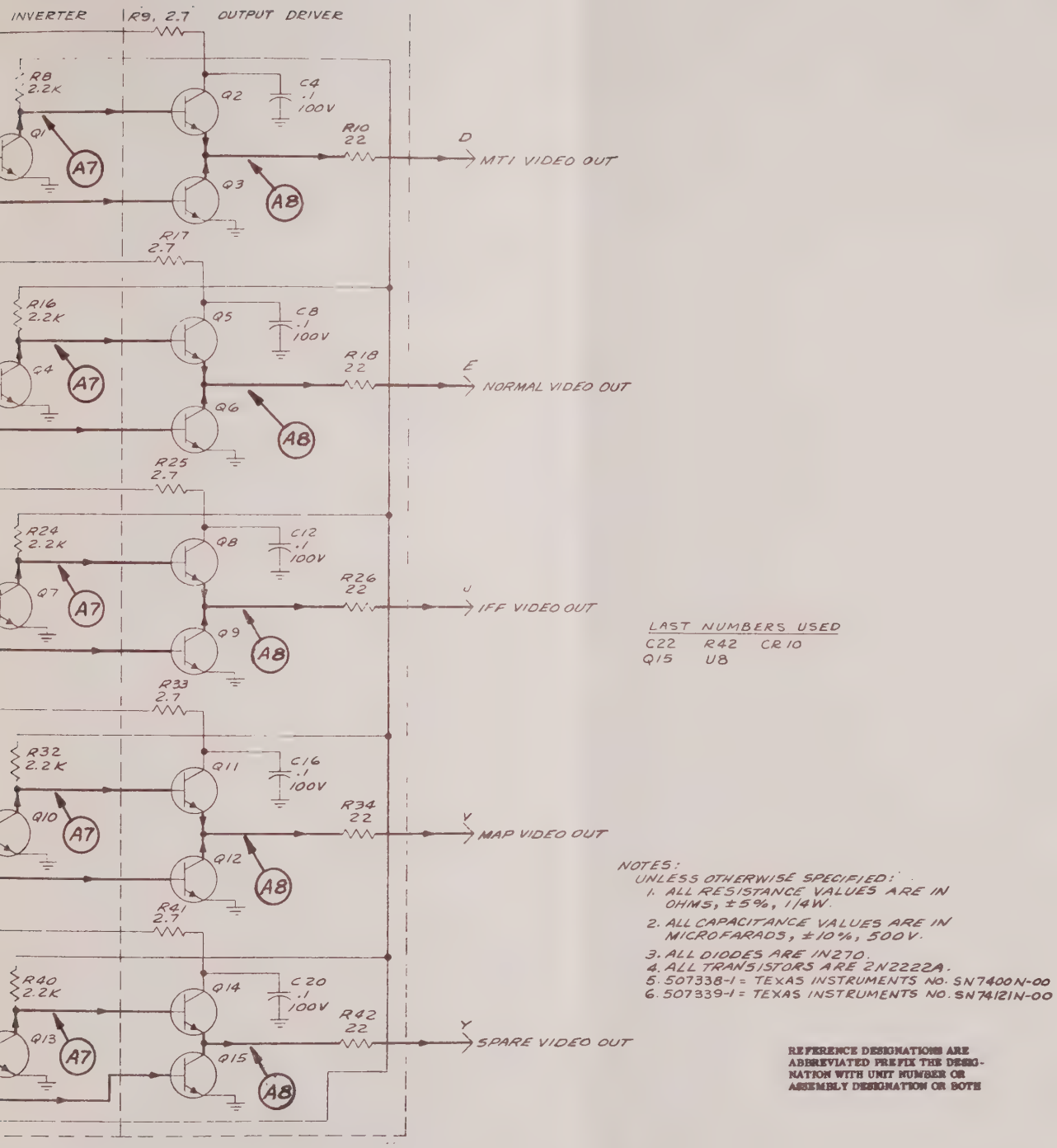


Figure 7-2. Oscillator Pretrigger and Video Delay (A1), Schematic Diagram



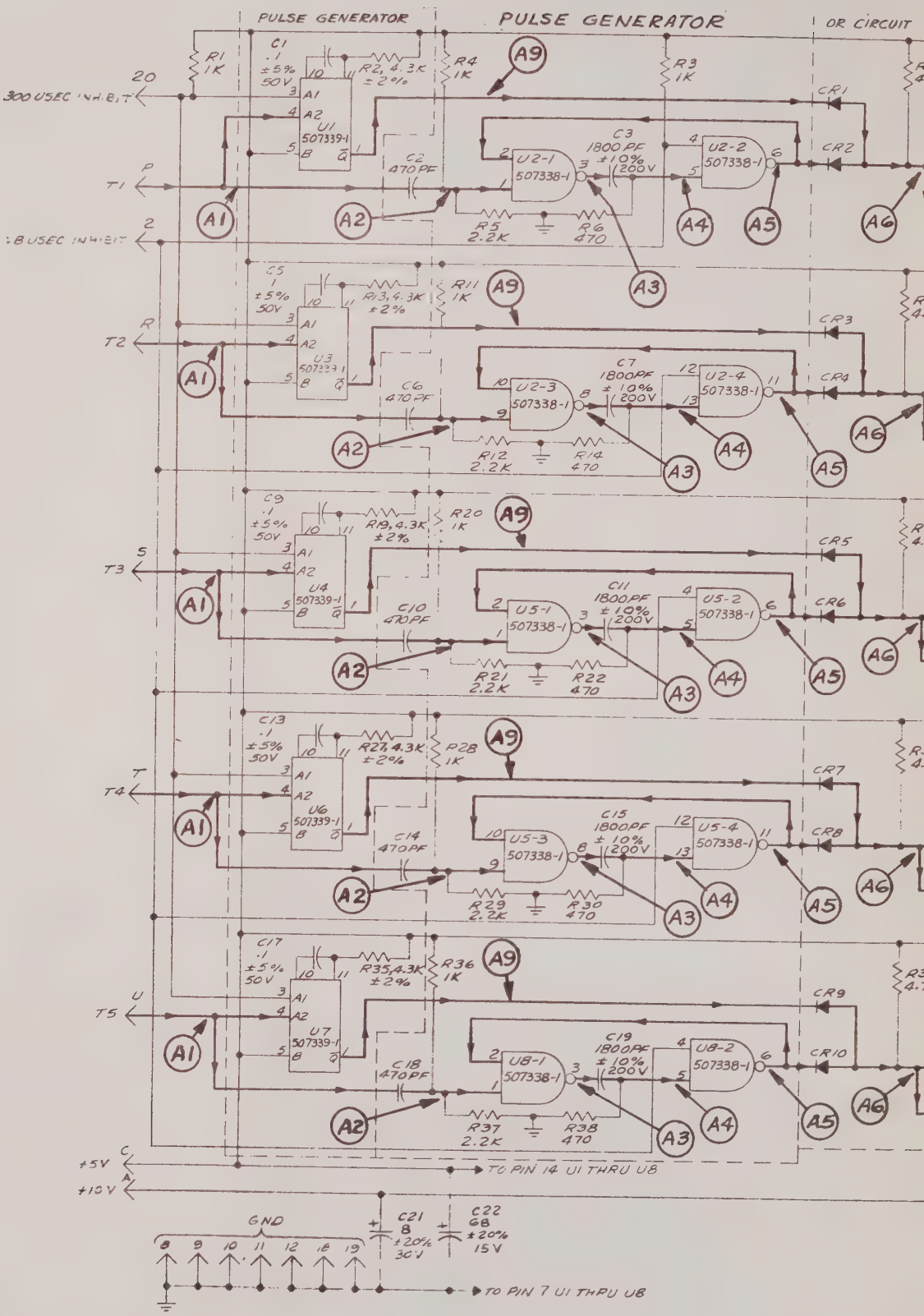
LAST NUMBERS USED

C22	R42	CR10
Q15	U8	

NOTES:
UNLESS OTHERWISE SPECIFIED:
1. ALL RESISTANCE VALUES ARE IN OHMS, ±5%, 1/4W.
2. ALL CAPACITANCE VALUES ARE IN MICROFARADS, ±10%, 500V.
3. ALL DIODES ARE IN270.
4. ALL TRANSISTORS ARE 2N2222A.
5. 507338-1 = TEXAS INSTRUMENTS NO. SN7400N-00
6. 507339-1 = TEXAS INSTRUMENTS NO. SN7412IN-00

REFERENCE DESIGNATIONS ARE ABBREVIATED PREFIX THE DESIGNATION WITH UNIT NUMBER OR ASSEMBLY DESIGNATION OR BOTH

Figure 7-3. Video Generator and Line Driver (A2), Schematic Diagram


PULSE GENERATOR
PULSE GENERATOR
OR CIRCUIT
300 USEC INHIBIT
8 USEC INHIBIT
T1
T2
T3
T4
T5
R1 1K
C1 .1 ±5% 50V
R2, 4.3K ±2%
R4 1K
R3 1K
U1 507339-1
C2 470 PF
U2-1 507338-1
U2-2 507338-1
C3 1800 PF ±10% 200V
R5 2.2K
R6 470
CR1
CR2
C5 .1 ±5% 50V
R13, 4.3K ±2%
R11 1K
U3 507339-1
C6 470 PF
U2-3 507338-1
U2-4 507338-1
C7 1800PF ±10% 200V
R12 2.2K
R14 470
CR3
CR4
C9 .1 ±5% 50V
R19, 4.3K ±2%
R20 1K
U4 507339-1
C10 470PF
U5-1 507338-1
U5-2 507338-1
C11 1800PF ±10% 200V
R21 2.2K
R22 470
CR5
CR6
C13 .1 ±5% 50V
R27, 4.3K ±2%
R28 1K
U6 507339-1
C14 470PF
U5-3 507338-1
U5-4 507338-1
C15 1800PF ±10% 200V
R29 2.2K
R30 470
CR7
CR8
C17 .1 ±5% 50V
R35, 4.3K ±2%
R36 1K
U7 507339-1
C18 470PF
U8-1 507338-1
U8-2 507338-1
C19 1800PF ±10% 200V
R37 2.2K
R38 470
CR9
CR10
A1
A2
A3
A4
A5
A6
A9
+5V
+10V
TO PIN 14 U1 THRU U8
GND
C21 8 ±20% 30V
C22 68 ±20% 15V
TO PIN 7 U1 THRU U8

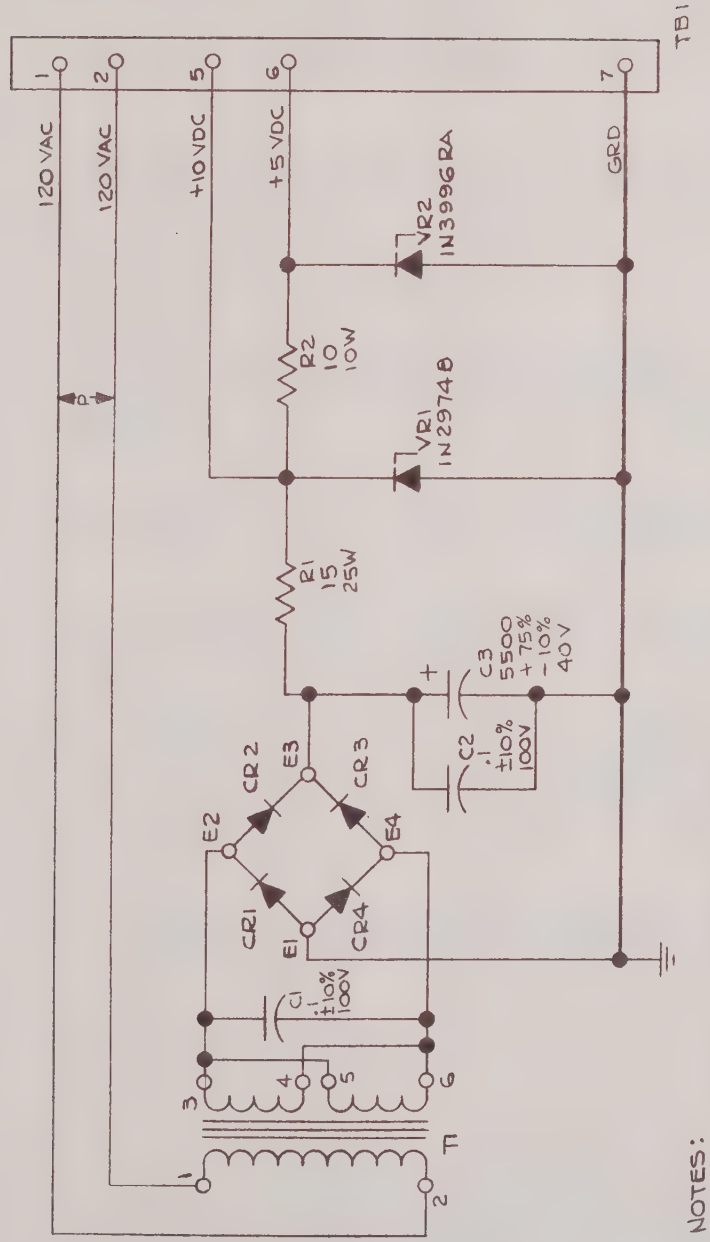


Figure 7-4. Power Supply (A3), Schematic Diagram

CHAPTER 8

ILLUSTRATED PARTS BREAKDOWN

SECTION I

INTRODUCTION

8-1. GENERAL.

8-2. The illustrated parts breakdown consisting of Chapter 8 of this manual lists and describes the parts of the Generator, Multiple, Pulse SG-1021/G.

8-3. MANUAL ORGANIZATION AND CONTENT.

8-4. The illustrated parts breakdown consists of the following sections: Introduction (Section I), Group Assembly Parts List (Section II), Numerical Index (Section III), and Reference Designation Index (Section IV).

8-5. SECTION I, INTRODUCTION. The Introduction contains information and instructions for the use of the Illustrated Parts Breakdown.

8-6. SECTION II, GROUP ASSEMBLY PARTS LIST. The Group Assembly Parts List is divided into representative main assemblies. These main assemblies are as shown in figure 1.

8-7. Each main assembly is broken down into subassemblies, sub-subassemblies, and details thereof. Each item is arranged to indicate relationship to its next higher assembly (NHA), and is listed in order of disassembly except where the sequence of disassembly does not apply.

8-8. All parts of the unit are listed except parts that have lost their identity by being permanently joined to another part (e.g., two parts welded together) and items made from bulk stock (e.g., hook-up wire).

8-9. GROUP ASSEMBLY PARTS LIST COLUMN DATA. The Group Assembly Parts List consists of six columns.

8-10. The figure and index number column contains an identifying number for each part shown in each illustration. This identifying number consists of the applicable figure number separated from the index number by a hyphen. Components and assemblies that have been added are identified by the addition of a suffix letter in the index number.

8-11. Part Numbers in the part number columns are Government standard part numbers, International Telephone and Telegraph,

Aerospace/Optical Division part numbers or vendor part numbers. A vendor part number is designated by a manufacturer's five digit code number appearing in the description column immediately after the nomenclature. All other part numbers are either Government standard or International Telephone and Telegraph, Aerospace/Optical Division part numbers.

8-12. The indent column contains leader points indicating item relationships to the assemblies on which they are used, as described in paragraph 8-7.

8-13. The description column contains the names of the items as listed in the title block of engineering drawings, or names assigned by the manufacturer, plus the additional modifiers necessary to insure identity of the items. Parts identified by Government standards are described by listing the name of the item only.

8-14. When the item is not a Government standard part or is manufactured by someone other than the equipment manufacturer, the manufacturer of the item is identified by a 5-digit code number after the item name enclosed in parenthesis. Following the item manufacturer's code number is the number the equipment manufacturer has assigned to the item (e.g., "RELAY, ARMATURE (15432) SPEC DWG 425162-1"). The 5-digit manufacturer's code numbers are obtained from Cataloging Handbook H4-1.

8-15. The units per assembly column indicates the number of units required per assembly, per subassembly, and per sub-subassembly as applicable. If more than one assembly is required, the total of such assemblies is shown. For detail or subassembly parts of this major assembly, the quantity required for ONE major assembly is shown. Where items are listed for reference purposes, the symbol "REF" is inserted in the units per assembly column.

8-16. The usable on code column contains coding symbols for assemblies and parts to indicate specific differences among the various equipments covered according to serial, type, or model. In addition, this column is used to differentiate between similar assemblies used on one equipment. This eliminates the necessity for more than one breakdown and illustration of the similar assemblies. In this manual, explanation of the usable on code numbers is given at the beginning of the individual parts list. Where the usable on code column is blank, the part listed is usable as a replacement on all articles covered by this manual.

8-17. Policies, general information, and procedures for changing source and maintenance coding are contained in T.O. 00-25-195. Generally, the source codes, and maintenance repair level codes herein (see Source Code and Repair Code columns) were assigned by Air Force personnel when this equipment was purchased. Assignment of codes was influenced by (a) maintenance policies, (b) predicted maintenance actions, (c) base facilities and capabilities, (d) economic considerations. Definitions of these codes follow:

a. "P" Series-Parts Procured and under Inventory Stock Control:

1. Code "P" identifies parts which may be requisitioned and installed by any level of maintenance consistent with the activity's authorized scope of maintenance. Code "P" is applied to parts on which usage is anticipated or known. Restricted (emergency) service manufacture of code "P" items is considered practical but may be accomplished only after confirmation of non-availability from supply sources.

2. Code "PD" identifies parts which may be requisitioned and installed by AF activities authorized depot-level maintenance only. Code "PD" is applied to parts on which usage is anticipated or known. Restricted (emergency) service manufacture of code "PD" parts is considered practical but may be accomplished only after confirmation of non-availability from supply sources.

3. Code "P1" identifies parts which may be requisitioned and installed by any maintenance level consistent with the activity's authorized scope of maintenance. Code "P1" is applied to parts on which usage is anticipated or known, and which service manufacture is considered impractical.

4. Code "P1D" identifies parts which may be requisitioned and installed by AF activities authorized depot-level maintenance only. Code "P1D" is applied to parts on which usage is anticipated or known, and which service manufacture is considered impractical.

5. Code "P2" identifies insurance type parts which can be installed by any activity within their authorized scopy of maintenance. This code is applied to parts which have limited usage and are difficult, impractical or uneconomical to manufacture. These items are not subject to periodic replacement or wear-out. Infrequent replacement may result from deterioration or other unexpected occurrence. High reliability, long service life and delayed procurement items are included under this code.

6. Code "P2D" identifies insurance-type parts which may be installed by AF activities which are authorized depot-level maintenance only. This code is applied to parts as described under code "P2" and to delayed procurement items.

b. "M" Series-Manufacture, Parts not Procured:

1. Code "M" identifies parts, the manufacture and installation of which are within the capabilities of field maintenance activities, and to which all of the following conditions apply:

(a) Procurement is not justified because of low usage or peculiar storage and installation factors. Needs are to be met by local manufacture only as required.

(b) Their manufacture does not require tools, equipment, or skills not normally authorized at field maintenance level.

(c) Does not require test equipment not normally authorized at field maintenance level.

(d) Does not require material not normally available in AF inventory.

2. Code "M1" identifies parts which can be manufactured at activities authorized depot-level maintenance facilities and to which all of the following conditions apply:

(a) Procurement is not justified because of low usage or peculiar storage and installation factors. The need of base activities is to be met by requisitioning from the SM AMA or IM AMA.

(b) Their manufacture is beyond capabilities of field maintenance activities as outlined above.

(c) Their manufacture does not require tools or equipment not normally authorized at all AMAs.

c. "A" Series-Assemble, Assembly not Procured:

1. Code "A" identifies items capable of being assembled at any level of maintenance and is applied to assemblies of two or more parts, the majority of which are purchased and/or service manufactured.

2. Code "A1" identifies assemblies which can be assembled at AF activities authorized depot-level maintenance only and is applied to assemblies described under "A" code.

d. "X" Series-Parts Considered Impractical for Service Manufacture:

1. Code "X" is applied to main structural members or similar parts, which, if required, would suggest extensive repair. The need for a part or parts coded "X" (wing spurs, center section structure, etc.) should normally result in a recommendation to retire the article from service.

2. Code "X1" identifies parts applicable at any level of maintenance consistent with the activity's authorized scope of maintenance and for which it is more feasible to obtain the next higher assembly; for example; an integral detail part such as a welded segment inseparable from its assembly; a part machined in a matched set; or a part of any assembly which, if required, would suggest extensive reconditioning of such assembly. In some cases, code "X1" may be used to indicate an integral detail part of an assembly which has no anticipated usage and as an assembly was source-coded "M" or "M1".

3. Code "X1D" identifies parts which are described under the "X1" code but which are applicable to AF activities authorized depot-level maintenance only.

4. Code "X2" identifies parts which are applicable to any level of maintenance consistent with the activity's authorized scope of maintenance, for which there is no anticipated usage, and which are impractical for service manufacture. This type of item will not be stocked. Such parts shall be obtained from reclamation or, if not available from this source, requisitioned through normal supply channels together with supporting justification for one-time procurement and immediate use. Repeated requests shall justify a change to a code "P1" or "P2", as applicable, if considered economical to procure and store such parts.

5. Code "X2D" identifies parts which are described under the "X2" code but which are applicable to AF activities authorized depot-level maintenance only. Repeated requests for such parts shall justify a change to a "P1D" or "P2D" code as applicable, if considered economical and feasible to procure and stock such parts.

e. Code "U" -Parts not Procured, Manufactured, or Stocked. Code "U" is applied to installation drawings, diagrams, instruction sheets, field-service drawing numbers, and parts not otherwise of supply significance, including obsolete parts, which cannot be procured or service manufactured.

8-18. Codes for Parts Kits:

a. Code "F" -Minor or Field Parts Kit. Code "F" is applied to kits which are available in all maintenance activities authorized to perform base level repair of the end item, including overhaul activities in support of field activities.

b. Code "D" -Major Overhaul Parts Kit. Code "D" is applied to kits which are available only to those activities authorized to perform depot level repair.

c. Identification of Components of Parts Kits:

1. Code "KF". Code "KF" is applied to items which are components of F-Kits.

2. Code "KD". Code "KD" is applied to items which are components of D Kits.

3. Code "KB". Code "KB" is applied to items which are components of both an F-Kit and D-Kit.

4. Items which are source coded "KD", "KF", or "KB", and for which the application of such items are peculiar to repair kits, will not be stocked separately and will not be assigned to FSN or any additional source codes.

5. Items which are source coded "KD", "KF", or "KB", and for which the application of such items are common to repair kits and to other repair or overhaul applications, will be stocked separately in the appropriate commodity class if followed by the letter "P".

8-19. Maintenance Repair Level Codes. The following are the maintenance repair level codes and their definitions:

a. CODE "S" - NO REPAIR. Code "S" identifies items which are nonreparable and have no reclamation value. When these items fail they will be disposed of at user level as condemned material.

b. CODE "B" -NO REPAIR; RECONDITION. Code "B" identifies assemblies or parts that will be reconditioned at the user level by adjusting, cleaning, soldering broken connections, etc. If these items cannot be returned to serviceable condition by such means they will be disposed of at user level as condemned material. No repair parts or tools are specially procured for maintenance of these items.

c. CODE "F" -REPAIR AT FIELD LEVEL. Code "F" identifies items which will be repaired by the field level maintenance activities. Normal servicing will be done by organizational level maintenance. Selected parts, tools, and technical order data are procured and provided to applicable field level maintenance activities for repair of these items. No SRA is established for these items. If the condition of these items is such that they cannot be returned to serviceable condition by the field level maintenance activity with authorized parts and tools, they will be disposed of as condemned material. If repair of "F" coded items cannot be accomplished due to non-availability of authorized parts, tools, or other capability, the applicable SM/IM will be so advised with request for disposition instructions. "F" coded critical items, regardless of condition, will be returned to supply for deposition instructions from the applicable SM/IM.

d. CODE "D" -LIMITED FIELD REPAIR; DEPOT OVERHAUL. Code "D" identifies items on which a limited degree of repair can be accomplished by field level maintenance activities. Normal servicing will be done at organizational level. SRA is established for overhaul of these items. A range of repair parts, tools, and technical order data consistent with the capability of repair are procured and provided to applicable field maintenance activities. Because of the design characteristics and complexity of repair, the degree of repair which is authorized on these items at the field maintenance level is necessarily determined by the degree of technical skills required and the cost of special tools, special test equipment, spare parts, and the predicted frequency of failure. If these items cannot be returned to serviceable condition with authorized parts and tools they will be returned to supply for shipment to the designated SRA.

e. CODE "DM" -LIMITED FIELD REPAIR; MOBILE DEPOT OVERHAUL. Code "DM" identifies items to which all the conditions of code "D" apply except that repair beyond field capability will be done by the mobile depot activity (MDA). If the MDA cannot repair these items, disposition instructions will be requested from the IM.

f. CODE "L" - DEPOT LEVEL MAINTENANCE ONLY. Code "L" identifies items that will be repaired only at designated SRA. Necessary parts, repair equipment or overhaul capabilities are available at these activities. Required functional checkout and bench check equipment may be provided to applicable organizational and field level maintenance activities for accomplishing external adjustment or calibration and for verifying serviceability of these items. Items found unserviceable will be returned to supply for shipment to the SRA.

g. CODE "LM" -DEPOT LEVEL MAINTENANCE ONLY; MOBILE DEPOT ACTIVITY. Code "LM" identifies items to which all conditions of Code "L" apply except that repair will be accomplished by MDA. If MDA cannot repair these items, they will determine whether these items should be condemned or sent to the SRA.

8-20. SECTION III, NUMERICAL INDEX. The numerical index is a list of all parts contained in the Group Assembly Parts List, arranged in the order specified in specification MIL-M-8910.

8-21. NUMERICAL INDEX COLUMN DATA. Briefly, the part number arrangement is as follows. Using the first character of the part number (from the left hand side), the sequence is:

a. Letters A through Z (excluding O).

b. Numerals 0 through 9 (the letter O is considered the numeral zero).

For the second and succeeding characters (from the left), the sequence is:

a. Space (blank)

b. Diagonal (slant) (/)

c. Point (period) (.)

d. Dash (-)

e. Letters A through Z (excluding O)

f. Numerals 0 through 9

8-22. Items which have part numbers stamped or otherwise shown on the physical article, but which are not required to be listed in the Group Assembly Parts List (e.g., welded parts) have their part numbers listed followed by a code showing the next higher assembly of which they are a part.

Example:

PART NUMBER	FIGURE AND INDEX NUMBER	QUANTITY PER ARTICLE
472145-5	(NHA) 907365-G3	

8-23. When another part number, other than the original manufacturer's number, has been assigned in a part, both numbers are shown in their proper numerical sequence. The part that is not listed in the part number column of the Group Assembly Parts List has a note showing the original manufacturer's part number.

Example:

PART NUMBER	FIGURE AND INDEX NUMBER	QUANTITY PER ARTICLE
615302-8	(See 3-105)	

8-24. SECTION IV, REFERENCE DESIGNATION INDEX. The reference designations listed in Section IV are cross-referenced to part and figure-index numbers to facilitate rapid identification of parts for which only the reference designation is known.

8-25. The Reference Designation Index includes all components of electronic equipment having reference designations. The Reference Designation Index is divided into three columns consisting of the following:

a. Reference Designations - listed alphabetically and numerically.

b. Figure And Index No. - used to locate the corresponding part in the Group Assembly Parts List.

c. Part Number - assigned by the manufacture of the part.

The cross-reference system is employed in the Reference Designation Index.

Example:

REFERENCE DESIGNATION	FIGURE AND INDEX NO.	PART NUMBER
A2	2-21	8114931G1

8-26. VENDOR'S CODES. The vendor's codes used in Chapter 8 of this manual are as follows:

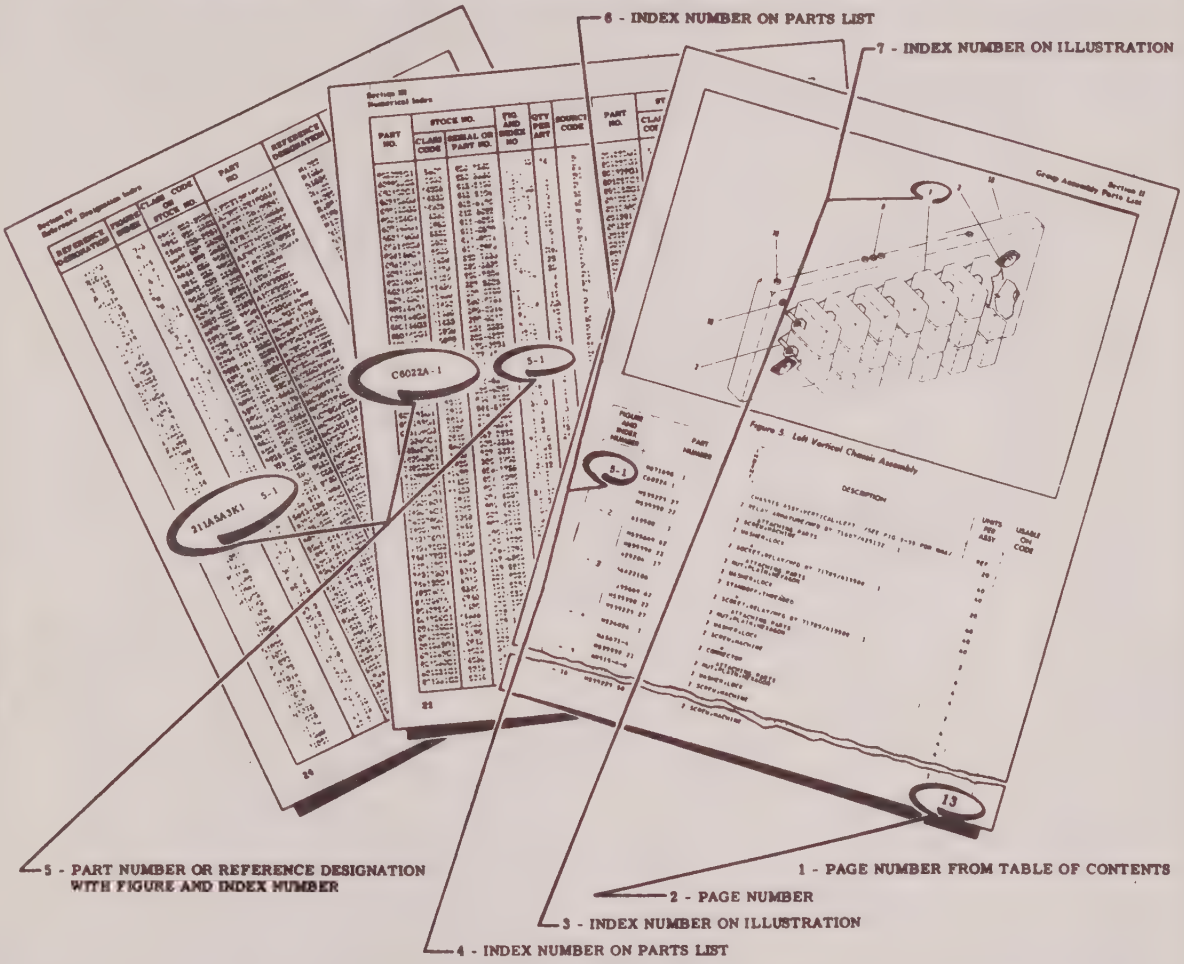
CODE	VENDOR'S NAME AND ADDRESS
01295	Texas Instruments Inc. Semiconductor Components Div. 13500 North Central Expressway Dallas, Texas 75231
07047	The Ross Milton Co. 511 Second Street Pike Southampton, Pa. 18966
18677	Scanbe Mfg. Corp. 1161 Monterey Pass Road Monterey Park, Calif. 91754
28105	Dearborn Wire and Cable Corp. 3333 West Ohio Street Chicago, Ill. 60607
31550	ITT Aerospace/Optical Division of International Telephone and Telegraph Corp. 3700 East Pontiac St. Fort Wayne, Indiana 46803
50508	Magnetic Components Inc. 9367 William St. Rosemont, Ill. 60018
56289	Sprague Electric Co. North Adams, Mass. 01247
71785	TRW Electronic Components Cinch Div. 1501 Morse Ave. Elk Grove Village, Ill. 60007
74284	Skydyne A. Brooks and Perkins Co. P.O. Box 1106 River Rd. Port Jervis N.Y. 12771
78189	Illinois Tool Works Inc. Shakeproof Division St. Charles Road Elgin Ill. 60126
81312	Winchester Electronics Division Litton Industries Inc. Main Street and Hillside Avenue Oakville, Conn. 06770

CODE	VENDOR'S NAME AND ADDRESS
83330	Smith Herman H. Inc. 812 Spediker Ave. Brooklyn, N.Y. 11207
94144	Raytheon Co. Lexington, Mass.

8-27. ABBREVIATIONS.

FIG	Figure
NHA	Next Higher Assembly
PCT	Percent
PORM	Plus or Minus
SPEC	Specification
UF	Microfarad
VDC	Volts Direct Current

HOW TO USE THIS ILLUSTRATED PARTS BREAKDOWN


6 - INDEX NUMBER ON PARTS LIST
7 - INDEX NUMBER ON ILLUSTRATION
5 - PART NUMBER OR REFERENCE DESIGNATION WITH FIGURE AND INDEX NUMBER
1 - PAGE NUMBER FROM TABLE OF CONTENTS
2 - PAGE NUMBER
3 - INDEX NUMBER ON ILLUSTRATION
4 - INDEX NUMBER ON PARTS LIST

HOW TO FIND THE PART NUMBER IF THE LOCATION OF THE EQUIPMENT IN WHICH THE PART IS USED IS KNOWN:

(1) Turn to the Table of Contents and find the page number for the equipment in which the part is used.

(2) Turn to the page determined in step (1).

(3) Locate the part and its index number on the illustration.

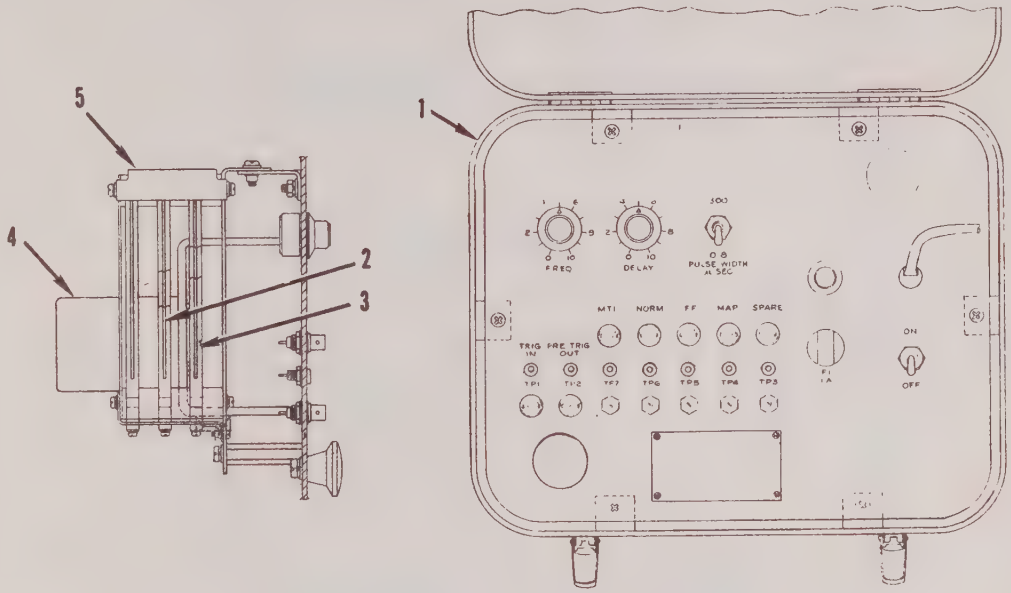
(4) Find the corresponding index number on the Group Assembly Parts List to obtain description.

HOW TO FIND THE ILLUSTRATION FOR A PART IF THE PART NUMBER OR REFERENCE DESIGNATION IS KNOWN:

(5) Refer to Section III, the Numerical Index or Section IV, the Reference Designation Index, find the part number or reference designation and determine the figure and index number of that part number.

(6) Turn to Section II, the Group Assembly Parts List, and find the first index number indicated in either the Numerical Index or Reference Designation Index for that part. If this illustration shows the part in a location other than the one desired, refer to the other figure numbers listed in the Numerical Index or Reference Designation Index, and repeat the above procedure.

(7) On the face of the illustration, find the index number determined in step (6).



INDEX NO.	DESCRIPTION	FIGURE NO.
1	Generator, Multiple, Pulse SG-1021/G	2
2	Video Generator and Line Driver	3
3	Oscillator, Pretrigger and Video Delay	4
4	Power Supply Assembly	5
5	Nest, Card	6

Figure 1. Generator, Multiple, Pulse SG-1021/G

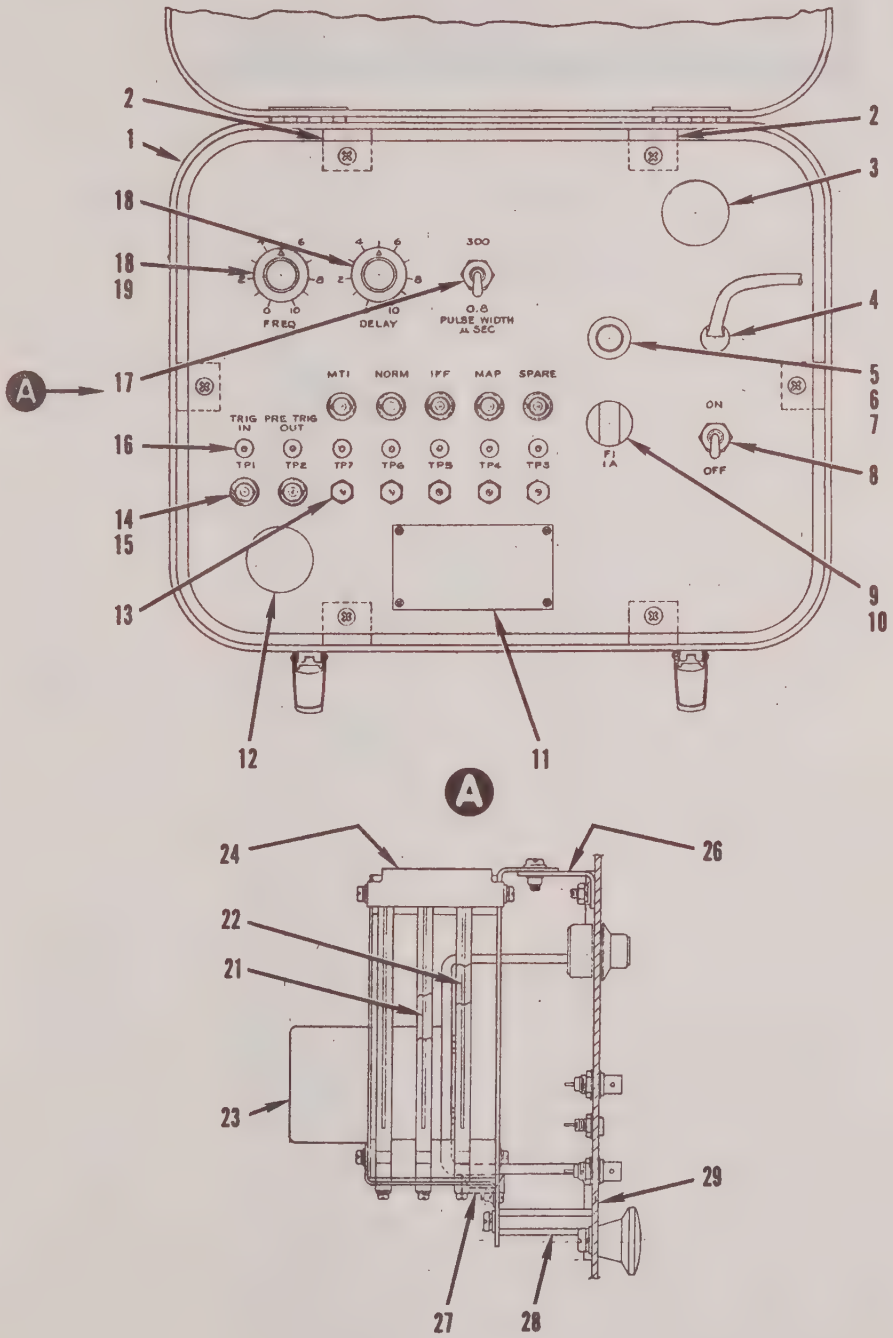


Figure 2. Generator, Multiple, Pulse SG-1021/G

SECTION II
GROUP ASSEMBLY PARTS LIST

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
2-	8114901G1	GENERATOR, MULTIPLE PULSE SG-1021/G	1	
- 1	302400	. CASE CARRYING (74284) SPEC DWG 501222-1	1	
		(ATTACHING PARTS)		
	MS51958-65	. SCREW	6	
	MS35338-138	. WASHER	6	
	MS15795-808	. WASHER	6	
		---*---		
- 2	SK-S2866W10-32	. FASTENER, EXTRUDED (74284) SPEC DWG 505131-1	6	
- 3	507578-1	. KNOB	1	
		(ATTACHING PARTS)		
	MS51957-81	. SCREW	1	
	MS35338-139	. WASHER	1	
	MS15795-810	. WASHER	1	
		---*---		
- 4	501064-1	. BUSHING, STRAIN RELIEF	1	
- 5	LC14CN3	. LENS	1	
- 6	NE51	. LAMP	1	
- 7	LH76-1	. LAMPHOLDER	1	
	8114943G1	. WIRE LIST	1	
	9603	. . CABLE, SPECIAL PURPOSE, ELECTRICAL (28105) SPEC DWG 501225-1	1	
	1497	. . TERMINAL, LUG (83330) SPEC DWG 514260-11	7	
	514261-5	. . TERMINAL, LUG	1	
	517875-1	. . WIRE, INSULATED	AR	
	MS3367-4-9	. . STRAP, TIEDOWN	14	
- 8	MS35059-22	. SWITCH	1	
- 9	F028250V1A	. FUSE	1	
- 10	FHL17G2	. FUSEHOLDER	1	
- 11	8114954-1	. PLATE, IDENTIFICATION	1	
		(ATTACHING PARTS)		
	MS51957-3	. SCREW	4	
	MS35338-134	. WASHER	4	
	MS15795-802	. WASHER	4	
		---*---		
- 12	507578-1	. KNOB	1	
		(ATTACHING PARTS)		
	MS51957-79	. SCREW	1	
	MS35338-139	. WASHER	1	
	MS15795-810	. WASHER	1	
		---*---		
- 13	RV6LAYSA501A	. RESISTOR	5	
- 14	M39012-21-0002	. CONNECTOR	7	
- 15	10221N	. BUSHING, NYLON (07047) SPEC DWG 501070-1	14	
- 16	M39024-10-03	. JACK, TIP	7	
- 17	MS35058-23	. SWITCH	1	
- 18	DS70-3-2	. KNOB (94144) SPEC DWG 507579-1	2	
- 19	RV4NAYSD503A	. RESISTOR	1	
- 20	RV4NAYSD253A	. RESISTOR	1	
- 21	8114931G1	. VIDEO GENERATOR AND LINE DRIVER (SEE FIG. 3 FOR BREAKDOWN)	1	
- 22	8114927G1	. OSCILLATOR, PRETRIGGER AND VIDEO DELAY (SEE FIG. 4 FOR BREAKDOWN)	1	
- 23	8114950G1	. POWER SUPPLY ASSEMBLY (SEE FIG. 5 FOR BREAKDOWN)	1	
		(ATTACHING PARTS)		
	MS35650-304	. NUT	6	
	MS35338-138	. WASHER	6	
	MS15795-808	. WASHER	6	
		---*---		
- 24	8114910G1	. NEST, CARD (SEE FIG. 6 FOR BREAKDOWN)	1	
		(ATTACHING PARTS)		
	MS51958-63	. SCREW	4	
	MS15795-808	. WASHER	4	
- 25	MS35338-138	. WASHER	2	
		---*---		
- 26	8114915G1	. BRACKET, MOUNTING,	1	
		(ATTACHING PARTS)		
	MS35650-304	. NUT	2	
	MS35338-138	. WASHER	2	
	MS15795-808	. WASHER	2	
		---*---		
- 27	327-11-C7-001	. TERMINAL, FANNING STRIP (71785) SPEC DWG 505132-6	1	
- 28	8114916-1	. POST	2	
- 29	8114919G1	. PANEL ASSEMBLY, FRONT	1	

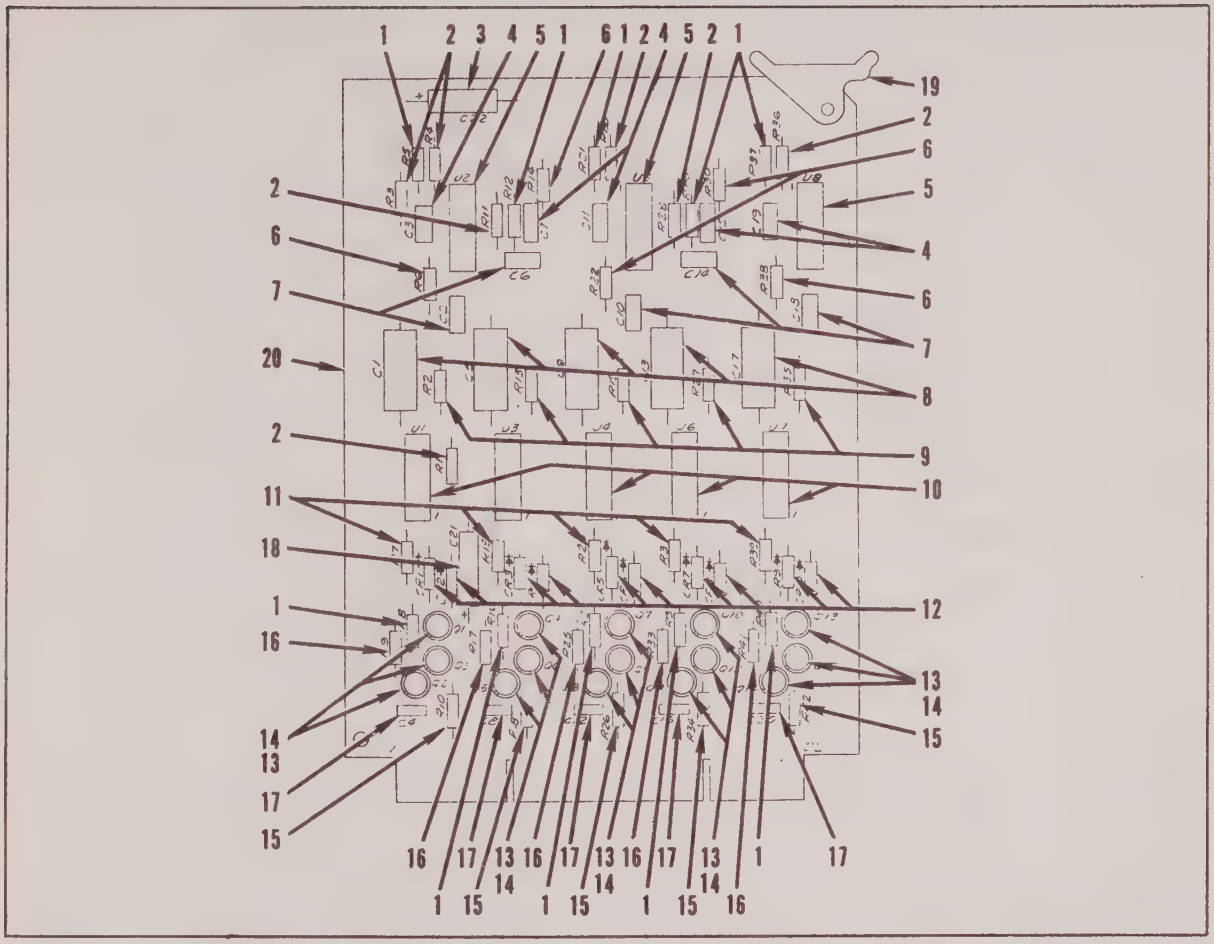


Figure 3. Video Generator and Line Driver

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
3-	8114931G1	VIDEO GENERATOR AND LINE DRIVER (SGE FIG. 2 FOR NHA)	REF	
- 1	RCR07G222JS	. RESISTOR	10	
- 2	RCR07G102JS	. RESISTOR	7	
- 3	M39003-01-2274	. CAPACITOR	1	
- 4	CK06BX182J	. CAPACITOR	5	
- 5	SN7400N00	. INTEGRATED CIRCUIT, QUADRUPLE 2 INPUT POSITIVE NAND GATES (01295) SPEC DWG 507338-1	3	
- 6	RCR07G471JS	. RESISTOR	5	
- 7	CK60AX471K	. CAPACITOR	5	
- 8	410P1045R5CE	. CAPACITOR, FIXED, POLYESTER FILM, 0.1 MFD PORM 5 PCT (56289) SPEC DWG 501221-1	5	
- 9	RLR07C432GR	. RESISTOR	5	
- 10	SN74121N00	. INTEGRATED CIRCUIT, MONOSTABLE MULTIVIBRATOR (01295) SPEC DWG 507339-1	5	
- 11	RCR07G472JS	. RESISTOR	5	
- 12	JAN1N270	. SEMICONDUCTOR DEVICE, DIODE	10	
- 13	JAN2N2222A	. TRANSISTOR	15	
- 14	10047DAP	. MOUNTING PAD, ELECTRICAL (07047) SPEC DWG 507253-12	15	
- 15	RCR07G220JS	. RESISTOR	5	
- 16	RCR07G2R7JS	. RESISTOR	5	
- 17	CK06BX104K	. CAPACITOR	5	
- 18	M39006-09-4294	. CAPACITOR	1	
- 19	S200	. LOCK EJECTOR (18677) SPEC DWG 507985-2	1	
- 20	8114934-1	. PRINTED WIRING BOARD	1	

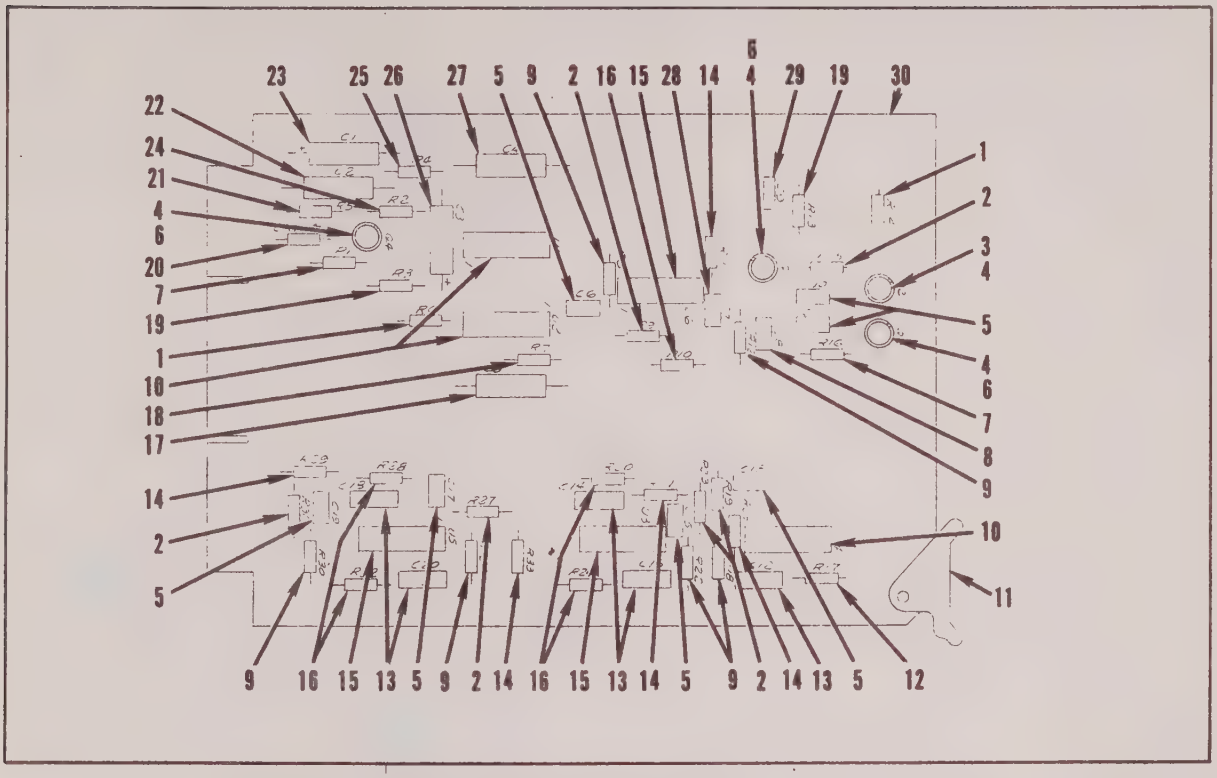


Figure 4. Oscillator, Pretrigger and Video Delay

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
4-	8114927G1	OSCILLATOR, PRETRIGGER AND VIDEO DELAY (SEE FIG. 2 FOR NHA)	REF	
- 1	RCR07G100JS	RESISTOR	2	
- 2	RCR07G222JS	RESISTOR	6	
- 3	JAN2N2907A	TRANSISTOR	1	
- 4	10047DAP	MOUNTING PAD, ELECTRICAL (07047) SPEC DWG 507253-12	4	
- 5	CK60AX471K	CAPACITOR	7	
- 6	JAN2N2222A	TRANSISTOR	3	
- 7	RCR07G103JS	RESISTOR	2	
- 8	CK60BX470K	CAPACITOR	1	
- 9	RCR07G102JS	RESISTOR	6	
- 10	SN74121N00	INTEGRATED CIRCUIT, MONOSTABLE MULTIVIBRATOR (01295) SPEC DWG 507339-1	3	
- 11	S200	LOCK EJECTOR (18677) SPEC DWG 507985-2	1	
- 12	RCR07G392JS	RESISTOR	1	
- 13	CK63AW103M	CAPACITOR	5	
- 14	RCR07G471JS	RESISTOR	5	
- 15	SN7400N00	INTEGRATED CIRCUIT, QUADRUPLE 2 INPUT POSITIVE NAND GATES (01295) SPEC DWG 507338-1	3	
- 16	RCR07G470JS	RESISTOR	5	
- 17	410P1045R5CE	CAPACITOR, FIXED, POLYESTER FILM, 0.1 MFD PORM 5 PCT (56289) SPEC DWG 501221-1	1	
- 18	RCR07G562JS	RESISTOR	1	
- 19	RCR07G331JS	RESISTOR	2	
- 20	JAN1N270	SEMICONDUCTOR DEVICE, DIODE	1	
- 21	RCR07G154JS	RESISTOR	1	
- 22	M39003-01-2274	CAPACITOR	1	
- 23	M39006-09-4294	CAPACITOR	1	
- 24	RCR07G181JS	RESISTOR	1	
- 25	RCR07G202JS	RESISTOR	1	
- 26	M39003-01-2289	CAPACITOR	1	
- 27	410P1549R5CE	CAPACITOR, FIXED, POLYESTER FILM, 0.15 MFD PORM 10 PCT (56289) SPEC DWG 501221-2	1	
- 28	CK61AW222M	CAPACITOR	1	
- 29	CK06BX104K	CAPACITOR	1	
- 30	8114930-1	PRINTED WIRING BOARD	1	

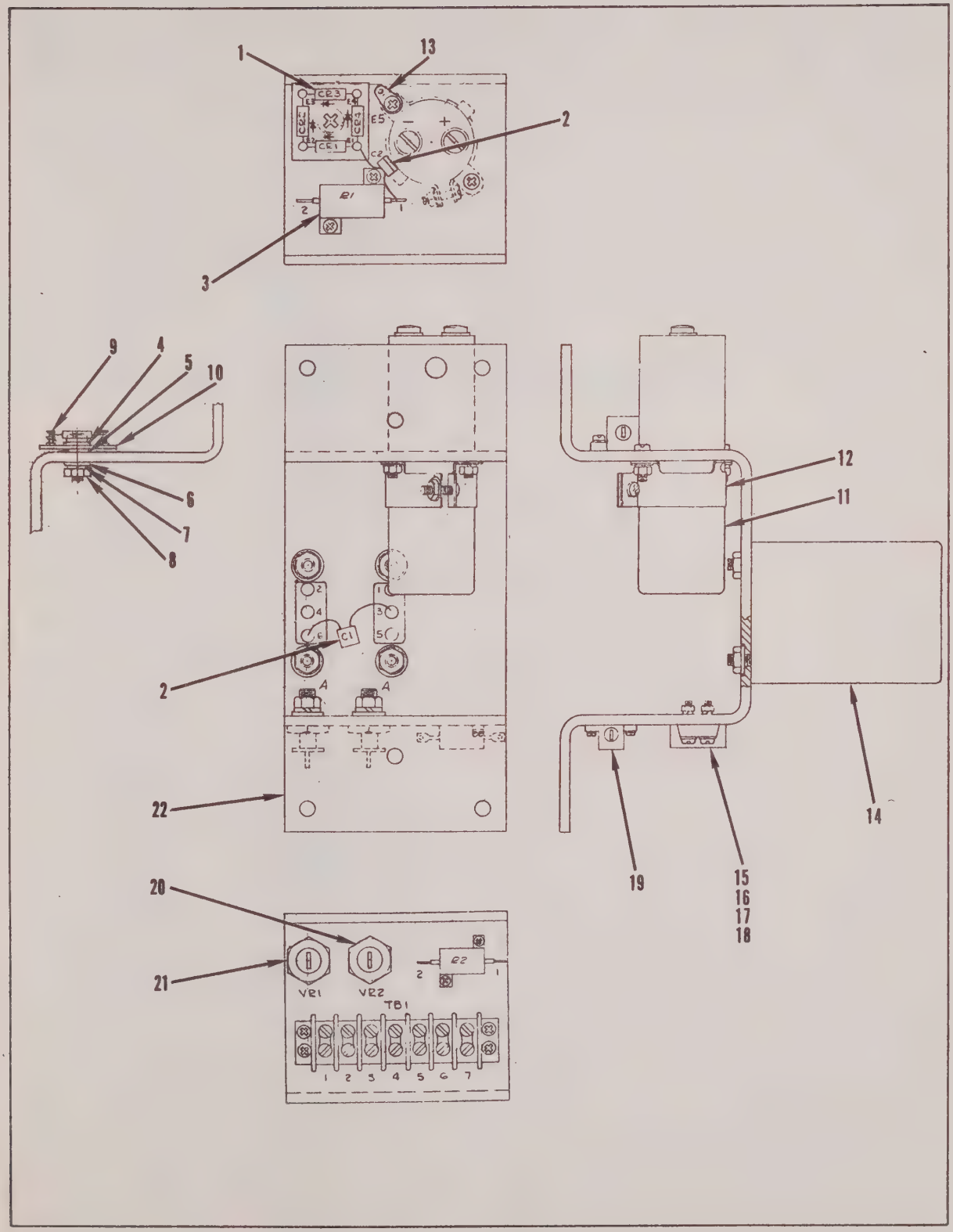


Figure 5. Power Supply Assembly

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
5-	8114950G1	POWER SUPPLY ASSEMBLY (SEE FIG. 2 FOR NHA)	REF	
- 1	JAN1N3611	. SEMICONDUCTOR DEVICE, DIODE	4	
- 2	CK068X104K	. CAPACITOR	2	
- 3	RE70G15R0	. RESISTOR	1	
		(ATTACHING PARTS)		
	MS51957-14	. SCREW	2	
	MS35338-153	. WASHER	2	
		---*---		
	8114924G1	. COMPONENT BOARD ASSEMBLY	1	
		(ATTACHING PARTS)		
	MS51958-64	. SCREW	1	
- 4	MS15795-808	. WASHER	1	
- 5	517691-5	. WASHER, NON METALLIC	1	
- 6	MS15795-808	. WASHER	1	
- 7	MS35338-138	. WASHER	1	
- 8	MS35650-304	. NUT	1	
		---*---		
- 9	SE12XC07	. . TERMINAL, STUD	4	
- 10	8114924-1	. . COMPONENT BOARD	1	
- 11	36D552G040AC2A	. CAPACITOR, FIXED, ELECTROLYTIC ALUMINUM, 5500 UF, 40 VDC, 0.13 OHMS MINUS 10 PCT, PLUS 75 PCT (56289) SPEC DW 501205-2	1	
		(ATTACHING PARTS)		
	MS51957-31	. SCREW	1	
	MS35338-136	. WASHER	1	
	MS35649-264	. NUT	1	
		---*---		
- 12	4586-97A	. RETAINER, CAPACITOR (56289) SPEC DWG 511152-4	1	
		(ATTACHING PARTS)		
	MS51957-30	. SCREW	2	
	MS15795-805	. WASHER	2	
	MS35338-136	. WASHER	2	
	MS35649-264	. NUT	2	
		---*---		
- 13	2102-06-00	. TERMINAL LUG (78189) SPEC DWG 514260-3	1	
- 14	30-10611	. TRANSFORMER, POWER, STEP DOWN (50508) SPEC DWG 515352-1	1	
		(ATTACHING PARTS)		
	MS15795-805	. WASHER	4	
	MS35338-136	. WASHER	4	
	MS35649-264	. NUT	4	
		---*---		
- 15	354-21-07-001	. TERMINAL BOARD, MOLDED BARRIER (71785) SPEC DWG 514287-6	1	
		(ATTACHING PARTS)		
	MS51957-32	. SCREW	4	
	MS15795-805	. WASHER	4	
	MS35338-136	. WASHER	4	
	MS35649-264	. NUT	4	
		---*---		
- 16	MS25036-102	. TERMINAL	5	
- 17	MS25036-103	. TERMINAL	2	
- 18	MS3367-4-9	. STRAP, TIEDOWN	5	
- 19	RE65G10R0	. RESISTOR	1	
		(ATTACHING PARTS)		
	MS51957-4	. SCREW	2	
	MS35338-134	. WASHER	2	
		---*---		
- 20	JAN1N3996RA	. SEMICONDUCTOR DEVICE, DIODE	1	
		(ATTACHING PARTS)		
	MS15795-808	. WASHER	1	
	MS35338-138	. WASHER	1	
	MS35650-304	. NUT	1	
		---*---		
- 21	JAN1N2974B	. SEMICONDUCTOR DEVICE, DIODE	1	
		(ATTACHING PARTS)		
	MS15795-808	. WASHER	1	
	MS35338-138	. WASHER	1	
	MS35650-304	. NUT	1	
		---*---		
- 22	8114920-1	. BRACKET, POWER SUPPLY	1	

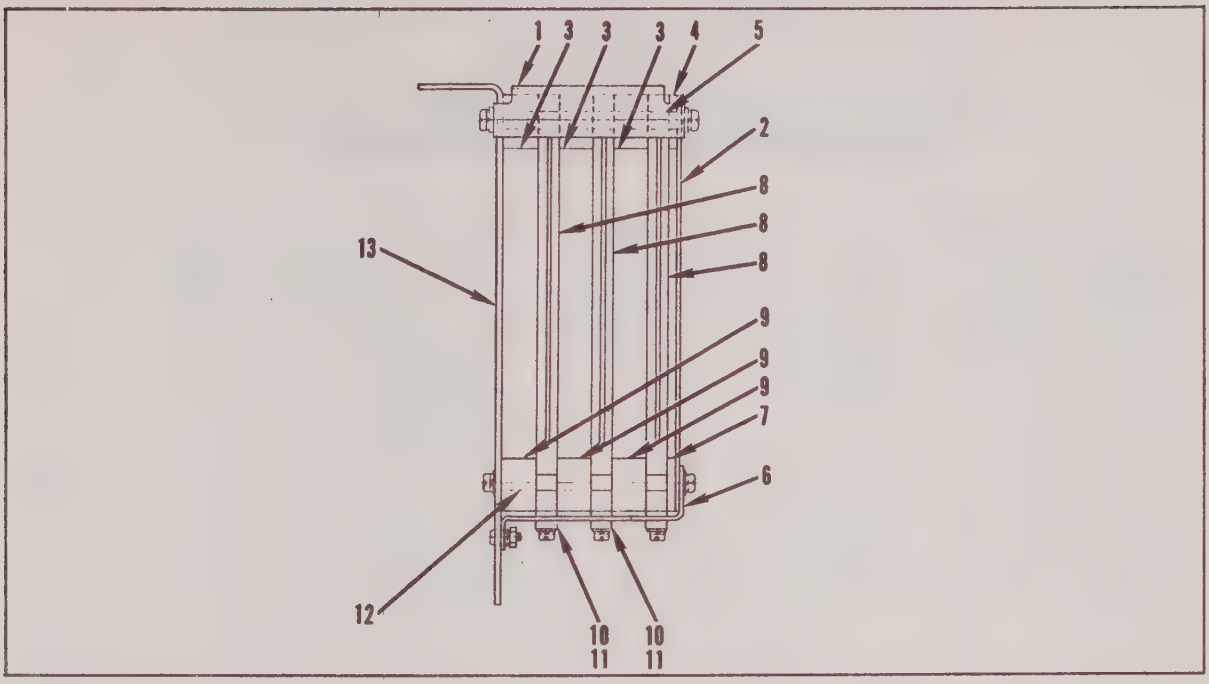


Figure 6. Nest, Card

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-	8114910G1	NEST, CARD (SEE FIG. 2 FOR NHA)	REF	
- 1	8114953-2	BRACKET, MARKING	1	
		(ATTACHING PARTS)		
	MS51957-45	SCREW	2	
	MS35338-137	WASHER	2	
	MS15795-807	WASHER	2	
		---*---		
- 2	8114918-1	PANEL, CARD NEST, LOWER	1	
		(ATTACHING PARTS)		
	MS51957-47	SCREW	3	
	MS35338-137	WASHER	3	
	MS15795-807	WASHER	3	
		---*---		
- 3	R102-500	SPACER, NYLON (18677) SPEC DWG 512746-4	3	
- 4	R102-125	SPACER, NYLON (18677) SPEC DWG 512746-1	1	
- 5	8114907-1	BAR, CARD GUIDE	1	
- 6	8114952-2	BRACKET, MARKING	1	
		(ATTACHING PARTS)		
	MS51957-15	SCREW	1	
	MS15795-803	WASHER	1	
	MS35338-135	WASHER	1	
	MS35649-244	NUT	1	
		---*---		
- 7	R102-125	SPACER, NYLON (18677) SPEC DWG 512746-1	3	
- 8	R301-60T	GUIDE, PRINTED CIRCUIT CARD (18677) SPEC DWG 506370-2	6	
- 9	R102-500	SPACER, NYLON (18677) SPEC DWG 512746-4	9	
- 10	M21097-1-163	CONNECTOR	2	
		(ATTACHING PARTS)		
	MS51957-16	SCREW	4	
	MS35338-135	WASHER	4	
	MS15795-803	WASHER	4	
		---*---		
- 11	109-8225	KEY, POLARIZING (81312) SPEC DWG 507530-2	4	
- 12	8114907-1	BAR, CARD GUIDE	3	
		(ATTACHING PARTS)		
	MS51957-45	SCREW	3	
	MS35338-137	WASHER	3	
	MS15795-807	WASHER	3	
		---*---		
- 13	8114917-1	PANEL, CARD NEST, UPPER	1	

SECTION III
NUMERICAL INDEX

PART NUMBER	FIGURE AND INDEX NUMBER	QTY. PER ART.	SOURCE CODE	REPAIR CODE
CK068X104K	3 - 17	8		
CK068X182J	3 - 4	5		
CK60AX471K	3 - 7	12		
CK60BX470K	4 - 8	1		
CK61AW222M	4 - 28	1		
CK63AW103M	4 - 13	5		
DS70-3-2	2 - 18	2		
FHL17G2	2 - 10	1		
FO2B250V1A	2 - 9	1		
JAN1N270	3 - 12	11		
JAN1N2974B	5 - 21	1		
JAN1N3611	5 - 1	4		
JAN1N3996RA	5 - 20	1		
JAN2N2222A	3 - 13	18		
JAN2N2907A	4 - 3	1		
LC14CN3	2 - 5	1		
LH76-1	2 - 7	1		
MS15795-802	2 - 11	4		
MS15795-803	6 - 6	5		
MS15795-805	5 - 12	10		
MS15795-807	6 - 1	8		
MS15795-808	2 - 1	22		
MS15795-810	2 - 3	2		
MS25036-102	5 - 16	5		
MS25036-103	5 - 17	2		
MS3367-4-9	2 - 7	19		
MS35058-23	2 - 17	1		
MS35059-22	2 - 8	1		
MS35338-134	2 - 11	6		
MS35338-135	6 - 6	5		
MS35338-136	5 - 11	11		
MS35338-137	6 - 1	8		
MS35338-138	2 - 1	19		
MS35338-139	2 - 3	2		
MS35338-153	5 - 3	2		
MS35649-244	6 - 6	1		
MS35649-264	5 - 11	11		
MS35650-304	2 - 23	11		
MS51957-14	5 - 3	2		
MS51957-15	6 - 6	1		
MS51957-16	6 - 10	4		
MS51957-3	2 - 11	6		
MS51957-31	5 - 11	1		
MS51957-32	5 - 15	4		
MS51957-4	5 - 19	2		
MS51957-45	6 - 1	5		
MS51957-47	6 - 2	3		
MS51957-79	2 - 12	1		
MS51957-81	2 - 3	1		
MS51958-63	2 - 24	4		
MS51958-64	5 - 3	1		
MS51958-65	2 - 1	6		
M21097-1-163	6 - 10	2		
M39003-01-2274	3 - 3	2		
M39003-01-2289	4 - 26	1		
M39006-09-4294	3 - 18	2		
M39012-21-0002	2 - 14	7		
M39024-10-03	2 - 16	7		
NE51	2 - 6	1	P1	S
RCR07G100JS	4 - 1	2		
RCR07G102JS	3 - 2	13		
RCR07G103JS	4 - 7	2		
RCR07G154JS	4 - 21	1		
RCR07G181JS	4 - 24	1		
RCR07G2R7JS	3 - 16	5		
RCR07G202JS	4 - 25	1		
RCR07G220JS	3 - 15	5		
RCR07G222JS	3 - 1	16		
RCR07G331JS	4 - 19	2		
RCR07G392JS	4 - 12	1		
RCR07G470JS	4 - 16	5		
RCR07G471JS	3 - 6	10		
RCR07G472JS	3 - 11	5		
RCR07G562JS	4 - 18	1		
RE65G10R0	5 - 19	1		
RE70G15R0	5 - 3	1		
RLR07C432GR	3 - 9	5		
RV4NAYSD253A	2 - 20	1		
RV4NAYSD503A	2 - 19	1		
RV6LAYSA501A	2 - 13	5		
R102-125	6 - 4	4	P1	S
	6 - 7			
R102-500	6 - 3	12	P1	S
	6 - 9			
R301-60T	6 - 8	6	P1	S
SE12XC07	5 - 9	4		
SK-S2866W10-32	2 - 2	6	P1	S
SN7400N00	3 - 5	6	P1	S
	4 - 15			
SN74121N00	3 - 10	8	P1	S
	4 - 10			
S200	3 - 19	2	P1	S
	4 - 11			
10047DAP	3 - 14	19	P1	S
	4 - 4			
10221N	2 - 15	14	P1	S
109-8225	6 - 11	4	P1	S
1497	2 - 7	7	P1	S
2102-06-00	5 - 13	1	P1	S
30-10611	5 - 14	1	P1	S
302400	2 - 1	1	P1	S
327-11-07-001	2 - 27	1	P1	S
354-21-07-001	5 - 15	1	P1	S
36D552G040AC2A	5 - 11	1	P1	S
410P1045R5CE	3 - 8	6	P1	S
	4 - 17			
410P1549R5CE	4 - 27	1	P1	S
4586-97A	5 - 12	1	P1	S
501064-1	2 - 4	1	P1	S
501070-1	SEE 10221N			
501205-2	SEE 36D552G040AC2A			
501221-1	SEE 410P1045R5CE			
501221-2	SEE 410P1549R5CE			
501222-1	SEE 302400			
501225-1	SEE 9603			
505132-6	SEE 327-11-07-001			
506370-2	SEE R301-60T			
507253-12	SEE 10047DAP			
507338-1	SEE SN7400N00			
507339-1	SEE SN74121N00			
507530-2	SEE 109-8225			
507578-1	2 - 3	2	P1	S
	2 - 12			
507579-1	SEE DS70-3-2			
507985-2	SEE S200			
511152-4	SEE 4586-97A			
512746-1	SEE R102-125			
512746-4	SEE R102-500			
514260-11	SEE 1497			
514260-3	SEE 2102-06-00			
514261-5	2 - 7	1	P1	S
514287-6	SEE 354-21-07-001			
515352-1	SEE 30-10611			
517691-5	5 - 5	1	P1	S
517875-1	2 - 7	AR	P1	S
8114901G1	2 -	1	P2	D
8114907-1	6 - 5	4	M1	D
	6 - 12			
8114910G1	2 - 24	1	A1	D
	6 -	REF		
8114915G1	2 - 26	1	M1	D
8114916-1	2 - 28	2	M1	D
8114917-1	6 - 13	1	M1	D
8114918-1	6 - 2	1	M1	D
8114919G1	2 - 29	1	A1	D
8114920-1	5 - 22	1	M1	D
8114924-1	5 - 10	1	M1	D
8114924G1	5 - 3	1	A1	D
8114927G1	2 - 22	1	P1	D
	4 -	REF		
8114930-1	4 - 30	1	X1	S
8114931G1	2 - 21	1	P1	D
	3 -	REF		
8114934-1	3 - 20	1	X1	S
8114943G1	2 - 7	1	U	
8114950G1	2 - 23	1	A1	D
	5 -	REF		
8114952-2	6 - 6	1	M1	D
8114953-2	6 - 1	1	M1	D
8114954-1	2 - 11	1	X2	S
9603	2 - 7	1	P1	S

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REFERENCE DESIGNATION	FIGURE AND INDEX NUMBER	PART NUMBER
A1	2 - 22	8114927G1
A1CR1	4 - 20	JAN1N270
A1C1	4 - 23	M39006-09-4294
A1C2	4 - 22	M39003-01-2274
A1C3	4 - 26	M39003-01-2289
A1C4	4 - 27	410P1549R5CE
A1C5	4 - 17	410P1045R5CE
A1C6	4 - 5	CK60AX471K
A1C7	4 - 28	CK61AW222M
A1C8	4 - 8	CK60BX470K
A1C9	4 - 29	CK06BX104K
A1C10	4 - 5	CK60AX471K
A1C11	4 - 5	CK60AX471K
A1C12	4 - 13	CK63AW103M
A1C13	4 - 5	CK60AX471K
A1C14	4 - 13	CK63AW103M
A1C15	4 - 5	CK60AX471K
A1C16	4 - 13	CK63AW103M
A1C17	4 - 5	CK60AX471K
A1C18	4 - 13	CK63AW103M
A1C19	4 - 5	CK60AX471K
A1C20	4 - 13	CK63AW103M
A1Q1	4 - 6	JAN2N2222A
A1Q2	4 - 3	JAN2N2907A
A1Q3	4 - 6	JAN2N2222A
A1Q4	4 - 6	JAN2N2222A
A1R1	4 - 7	RCR07G103JS
A1R2	4 - 24	RCR07G181JS
A1R3	4 - 19	RCR07G331JS
A1R4	4 - 25	RCR07G202JS
A1R5	4 - 21	RCR07G154JS
A1R6	4 - 1	RCR07G100JS
A1R7	4 - 18	RCR07G562JS
A1R8	4 - 9	RCR07G102JS
A1R9	4 - 2	RCR07G222JS
A1R10	4 - 16	RCR07G470JS
A1R11	4 - 14	RCR07G471JS
A1R12	4 - 9	RCR07G102JS
A1R13	4 - 19	RCR07G331JS
A1R14	4 - 1	RCR07G100JS
A1R15	4 - 2	RCR07G222JS
A1R16	4 - 7	RCR07G103JS
A1R17	4 - 12	RCR07G392JS
A1R18	4 - 9	RCR07G102JS
A1R19	4 - 2	RCR07G222JS
A1R20	4 - 16	RCR07G470JS
A1R21	4 - 14	RCR07G471JS
A1R22	4 - 9	RCR07G102JS
A1R23	4 - 2	RCR07G222JS
A1R24	4 - 16	RCR07G470JS
A1R25	4 - 14	RCR07G471JS
A1R26	4 - 9	RCR07G102JS
A1R27	4 - 2	RCR07G222JS
A1R28	4 - 16	RCR07G470JS
A1R29	4 - 14	RCR07G471JS
A1R30	4 - 9	RCR07G102JS
A1R31	4 - 2	RCR07G222JS
A1R32	4 - 16	RCR07G470JS
A1R33	4 - 14	RCR07G471JS
A1U1	4 - 10	SN74121N00
A1U2	4 - 10	SN74121N00
A1U3	4 - 15	SN7400N00
A1U4	4 - 10	SN74121N00
A1U5	4 - 15	SN7400N00
A1U6	4 - 15	SN7400N00
A2	2 - 21	8114931G1
A2CR1 THRU A2CR10	3 - 12	JAN1N270
A2C1	3 - 8	410P1045R5CE
A2C2	3 - 7	CK60AX471K
A2C3	3 - 4	CK06BX182J
A2C4	3 - 17	CK06BX104K
A2C5	3 - 8	410P1045R5CE
A2C6	3 - 7	CK60AX471K
A2C7	3 - 4	CK06BX182J
A2C8	3 - 17	CK06BX104K
A2C9	3 - 8	410P1045R5CE
A2C10	3 - 7	CK60AX471K
A2C11	3 - 4	CK06BX182J
A2C12	3 - 17	CK06BX104K
A2C13	3 - 8	410P1045R5CE
A2C14	3 - 7	CK60AX471K
A2C15	3 - 4	CK06BX182J
A2C16	3 - 17	CK06BX104K
A2C17	3 - 8	410P1045R5CE
A2C18	3 - 7	CK60AX471K
A2C19	3 - 4	CK06BX182J
A2C20	3 - 17	CK06BX104K
A2C21	3 - 18	M39006-09-4294
A2C22	3 - 3	M39003-01-2274
A2Q1 THRU A2Q15	3 - 13	JAN2N2222A
A2R1	3 - 2	RCR07G102JS
A2R2	3 - 9	RLR07C432GR
A2R3	3 - 2	RCR07G102JS
A2R4	3 - 2	RCR07G102JS
A2R5	3 - 1	RCR07G222JS
A2R6	3 - 6	RCR07G471JS
A2R7	3 - 11	RCR07G472JS
A2R8	3 - 1	RCR07G222JS
A2R9	3 - 16	RCR07G2R7JS
A2R10	3 - 15	RCR07G220JS
A2R11	3 - 2	RCR07G102JS
A2R12	3 - 1	RCR07G222JS
A2R13	3 - 9	RLR07C432GR
A2R14	3 - 6	RCR07G471JS
A2R15	3 - 11	RCR07G472JS
A2R16	3 - 1	RCR07G222JS
A2R17	3 - 16	RCR07G2R7JS
A2R18	3 - 15	RCR07G220JS
A2R19	3 - 9	RLR07C432GR
A2R20	3 - 2	RCR07G102JS
A2R21	3 - 1	RCR07G222JS
A2R22	3 - 6	RCR07G471JS
A2R23	3 - 11	RCR07G472JS
A2R24	3 - 1	RCR07G222JS
A2R25	3 - 16	RCR07G2R7JS
A2R26	3 - 15	RCR07G220JS
A2R27	3 - 9	RLR07C432GR
A2R28	3 - 2	RCR07G102JS
A2R29	3 - 1	RCR07G222JS
A2R30	3 - 6	RCR07G471JS
A2R31	3 - 11	RCR07G472JS
A2R32	3 - 1	RCR07G222JS
A2R33	3 - 16	RCR07G2R7JS
A2R34	3 - 15	RCR07G220JS
A2R35	3 - 9	RLR07C432GR
A2R36	3 - 2	RCR07G102JS
A2R37	3 - 1	RCR07G222JS
A2R38	3 - 6	RCR07G471JS
A2R39	3 - 11	RCR07G472JS
A2R40	3 - 1	RCR07G222JS
A2R41	3 - 16	RCR07G2R7JS
A2R42	3 - 15	RCR07G220JS
A2U1	3 - 10	SN74121N00
A2U2	3 - 5	SN7400N00
A2U3	3 - 10	SN74121N00
A2U4	3 - 10	SN74121N00
A2U5	3 - 5	SN7400N00
A2U6	3 - 10	SN74121N00
A2U7	3 - 10	SN74121N00
A2U8	3 - 5	SN7400N00
A3	2 - 23	8114950G1
A3CR1	5 - 1	JAN1N3611
A3CR2	5 - 1	JAN1N3611
A3CR3	5 - 1	JAN1N3611
A3CR4	5 - 1	JAN1N3611
A3C1	5 - 2	CK06BX1045
A3C2	5 - 2	CK06BX1045
A3C3	5 - 11	36D552G040AC2A
A3R1	5 - 3	RE70G15R0
A3R2	5 - 19	RE65G10R0
A3T81	5 - 15	354-21-07-001
A3T1	5 - 14	30-10611
A3VR1	5 - 21	JAN1N2974B
A3VR2	5 - 20	JAN1N3996RA
DS1	2 - 6	NE51
F1	2 - 9	F02B250V1A
J1	2 - 14	M39012-21-0002
J2	2 - 14	M39012-21-0002
J3	2 - 14	M39012-21-0002
J4	2 - 14	M39012-21-0002
J5	2 - 14	M39012-21-0002
J6	2 - 14	M39012-21-0002
J7	2 - 14	M39012-21-0002
R1	2 - 19	RV4NAYSD503A
R2	2 - 20	RV4NAYSD253A
R3	2 - 13	RV6LAYSA501A
R4	2 - 13	RV6LAYSA501A
R5	2 - 13	RV6LAYSA501A
R6	2 - 13	RV6LAYSA501A
R7	2 - 13	RV6LAYSA501A
S1	2 - 8	MS35059-22
S2	2 - 17	MS35058-23
TP1	2 - 16	M39024-10-03
TP2	2 - 16	M39024-10-03
TP3	2 - 16	M39024-10-03
TP4	2 - 16	M39024-10-03
TP5	2 - 16	M39024-10-03
TP6	2 - 16	M39024-10-03
TP7	2 - 16	M39024-10-03
XA1	6 - 10	M21097-1-163
XA2	6 - 10	M21097-1-163
XDS1	2 - 7	LH76-1
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